







Innovation Systems and the Periphery

FINAL REPORT

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Prologue

This document is a project report for a trans-national Nordic project referred to as *Innovation systems and the periphery* (ISP). The project has been carried out as a joint initiative of a team of researchers from Denmark, Finland, Iceland, Norway and Sweden. The team included the following partners:

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The core funding of the project was provided by the Nordic Innovation Centre (formerly the Nordic Industry Fund). Additional funding was also received from the following parties:

Danish Centre for Rural Research and Development, Denmark.

Chydenius Institute - Kokkola University Consortium and ProACT research programme funded by Ministry of Trade and Industry and Tekes, Finland.

Institute for Regional Development, Iceland.

CESIS - Centre of Excellence for Science and Innovation Studies at KTH (The Royal Institute of Technology), Sweden.

The project idea was developed and operationalized as a cooperative effort of the members of the research team. The research team also worked with a reference group, consisting of policy actors and representatives of providers of support services from the participating countries. The reference group members participated in project meetings and provided the research team with valuable advice throughout the project period. It should, however, be noted that the project results are solely the responsibility of the research team. The reference group included the following members:

Hanne Toksvig, National Agency for Enterprise and Housing	*Denmark*
Henrik Lodberg, National Agency for Enterprise and Housing	*Denmark*
Niels Gøtke, Ministry for Food, Agriculture and Fisheries	*Denmark*
Pentti Vuorinen, Ministry of Industry and Trade, Division of Technology Policy	*Finland*
Eero Uusitalo, Ministry of Agriculture and Forestry, Rural Policy Division	*Finland*
Risto-Matti Niemi, Ministry of Agriculture and Forestry, Rural Policy Division	*Finland*
Björn Gíslason, Impra Innovation Centre	*Iceland*
Halldór V. Kristjánsson, Institute for Regional Development	*Iceland*
Snorri Björn Sigurðsson, Institute for Regional Development	*Iceland*
Åge Sund, Distriktskommisjonen, Ministry of Local Gov. and Regional Dev. (KRD)	*Norway*
Wolfgang Pichler, National Board for Rural Development	*Sweden*
Erik Westholm, Ass. Professor Swedish Institute for Future Studies	*Sweden*

The gathering of empirical data, as well as the writing of the country-specific sections of the report, were carried out by the researchers from each country. The conclusions of the project as a whole were produced through a cooperative effort of the research team. Coordinating project leader was Elín Aradóttir researcher at UARI. She was also responsible for the editorship of this report.

The authors of this report would like to thank those organizations that provided the project with the necessary funds, as well as the reference group members, for their contribution to the project. Sincere thanks also go to the project's key informants (interviewees) from the selected study areas and other parts of the Nordic countries. The contribution of these people was of great value to the project, and these people's assistance and hospitality were greatly appreciated.

On behalf of the ISP research team,

Elín Aradóttir, researcher, UARI

Executive summary

What is the ISP project about and which methods were used?

The 'Innovation systems and the Periphery' project (ISP) is a trans-Nordic research project which builds on the premise that there is a need for increasing our knowledge of innovation systems in the periphery and to pay an increased attention to the design and implementation of innovation policy and innovation facilitation practice in the rural context. The project focused on the role of innovation and the nature of innovation processes in selected industries in chosen peripheral areas/regions of the Nordic countries.

> *The project's goal was to explore how innovation capabilities of firms, in selected industries in periphery regions, can be enhanced through the means of innovation and regional policy, and the strengthening of innovation systems.*

A case study approach was chosen as a research strategy. The four key research themes were: Innovation activity, knowledge and competence base, cooperation and networks, and innovation conditions. An emphasis was put on three industry sectors, i.e. tourism, agri-food production and manufacturing. The project partners also selected a study area within their home country, as well as a country-specific focus in regard to industry sector branches.

The project included 14 cases. Each of the cases explored the contemporary phenomenon of innovation within a single industry sector (industry focus) in a single Nordic area (geographical focus). Various available information resources, e.g. policy documents, relevant research reports, and statistics, were reviewed for each of the cases explored. Empirical data gathering also took place through semi-structured interviews with key-informants. The interviews were based on a standard list of questions. Key-informants included representatives of firms, as well as representatives of regional and national support agents (representatives of development groups, industry associations, educational institutes, R&D organizations, etc.). The empirical data gathering took place in the period of May to Sept. 2004. The table below lists the focus of the different ISP cases.

Geogrpahical focus	Industry focus
1) Ringkøbing and Viborg Counties: Denmark	Agri-food production: Dairy- and brewing industry
2) Ringkøbing and Viborg Counties: Denmark	Tourism: Recreational services that focus on local culture and environm.
3) Ringkøbing and Viborg Counties: Denmark	Manufacturing: Wood industry (furniture)
4) Central Ostrobothnia: Finland	Agri-food production: Dairy industry, crop processing, etc.
5) Central Ostrobothnia: Finland	Tourism: Recreational services that focus on local culture and environm.
6) Oulu South (Northern Ostrobothnia): Finland	Manufacturing: Electronics and wireless technology
7) Northwest region: Iceland	Agri-food production: Milki production and the dairy industry
8) Northwest region: Iceland	Tourism: Recreational services that focus on local culture and environm.
9) Lofoten: Norway	Agri-food production: Dairy- and meat production
10) Lofoten: Norway	Tourism: Recreational services that focus on local culture and environm.
11) Lofoten: Norway	Manufacturing: Cod aquaculture (fry production, production and maintenance of machinery and equipment.)
12) Dalarna county: Sweden	Agri-food production: Meat, crop processing and bread production
13) Dalarna county: Sweden	Tourism: Recreational services that focus on local culture and environm.
14) Dalarna county: Sweden	Manufacturing: Wood and metal industry

Key findings and lessons for policy making

The key findings of the ISP project and the corresponding policy recommendations are listed below. It should be noted that due to the varying national and regional settings for the case studies, the broad definition used of what constitutes an innovation, and the variability of the firms included in the study (e.g. in regard to size, competences, product mix, markets and location) generalizations from the findings and policy recommendations should be approached with caution. Hence, in the early process of innovation policy implementation, the findings and recommendations listed below should first be evaluated and moderated in the relevant national and regional context.

a) Acknowledgement of innovations in the periphery: Through the ISP project process a number of examples of "good innovation practice" have been identified. Although many of these innovations were small-scale and incremental in nature, these examples demonstrate that in spite of some apparent disadvantages, associated with peripheral locations, innovation is possible and taking place in the Nordic periphery. Innovation, furthermore, commonly seems to be considered necessary to stay in business and in that way seems to be looked upon as a survival strategy. It is important that policy makers reflect positive attitudes towards the broad topic of innovation in peripheral regions, for the purpose of creating an encouraging spirit in rural communities. The examples found by the ISP project should strengthen such attitudes and encourage policy makers to take on a proactive approach aiming at facilitating innovation in rural regions.

Examples of innovative firms that contributed to the ISP project:

- *The Thise Dairy, Denmark http://www.thise.dk/*
- *Lestipuu Oy, Finland http://www.lestipuu.fi/*
- *Keldudalur farm, Iceland http://www.keldudalur.is*
- *Lofilab, Norway http://www.lofilab.no/*
- *Siljans Chark, Sweden http://www.siljanschark.se/*

b) Utilization and evolution of rural ways of life for creation of innovative products: The ISP study shows that traditional practical knowledge (e.g. knowledge of cultural and natural/environmental aspects of rural communities), which is interwoven with rural identities, has produced innovative products that appeal to a broad market. This especially applies to the agrifood sector and the tourism sector. The findings of the ISP project, therefore, indicate that the rural ways of life can be a source for innovations. Policy makers should acknowledge and strengthen the utilization of this source by creating specific measures (support programs, development projects). Such measures should aim at generating opportunities for innovators to utilize local assets in product development and marketing efforts and thereby effectively draw from this source.

c) Transparency of policy - and official support schemes: Many of the ISP cases show that policy, and in some instances associated support services, are not visible enough to the firms participating in the ISP exercise. Limited awareness, lack of familiarity, and in some instances limited confidence towards the whole system of innovation facilitation, commonly seem to characterize the firm representatives' views. As indicated above, policy makers should emphasize making policy and official support schemes more readable, applicable and visible to end-users. An emphasis should be put on the local level

A quote from the Swedish ISP country report:

"Entrepreneurs in SMEs in Dalarna meet a virtual jungle of supporting agents at regional, national and EU level … It is difficult – or impossible – for the SME entrepreneur to get an overview of which facilities and services are supplied for his/her needs."

in this context. Such an emphasis should be an evident part of the public relation (PR) role of official support organizations. However, the goal should not only be to create a positive image, but merely an operational approachable and well-functioning policy and support system. The policy challenge ahead also includes a need for an emphasis on integrating traditional industries into national and supranational innovation facilitation systems. This implies, above all, a need for adjusting the existing, dominating rationales for policy measures, which can be summed up to strongly support technological and science-based innovation. The needed adjustment is in the direction of acknowledging non-science based knowledge as an input to innovation.

d) Dissolving "sectoral lock-in": The ISP findings indicate that, in some Nordic regions, certain industry sectors are quite isolated from other aspects of economic life in the regions studied. This especially applies to the agrifood sector, where this presents itself through the structure of supporting services, networking patterns of firms, involvement of support agents in cross-sectoral development initiatives, etc. It seems realistic to predict that future innovations within farming and food processing could benefit from closer relations to other specific industry sectors (e.g. tourism) as well as from various other cross-sectoral interaction and cooperation (e.g. in relation to branding). This message is important both for the operation of firms and support agents. These findings, therefore, indicate that there is a need to put a greater emphasis on cross-sectoral thinking and interaction in policy making. Such a cross-sectoral policy approach should be accompanied by practical implementation efforts in the form of concrete programmes or projects, aiming at better utilizing underexploited opportunities for innovations.

A quote from the Norwegian ISP country report:

"Surprisingly there is poor cooperation and not many formal networks between the agri-food sector and the tourism sector.

Local food trails can be developed to attract both local customers and visitors … Examples can be found where products of a special geographic origin have contributed to the marketing of the region. One Example is the Parma ham and the Parma region in Italy; this can maybe also be the fact for some products from Lofoten?"

e) Extending the knowledge and competence base: Although various valuable types of knowledge and competences were found across the ISP cases, it can be argued that improvement of the basic knowledge and competence base, of the firms studied, could contribute to their innovation potentials and the regions they operate in. Although general capacity building can be viewed as the primary need in this context, we can also argue that there is a need for improving the stock of formal advanced knowledge, especially among the firms and industries that have reached a certain level of maturity and sophistication. Policy makers should aim at strengthening the role of educational institutes within peripheral regions. Such involvement can e.g. be in the form of facilitating cooperative projects including partners from local/regional development groups or agencies, or in the form of strengthening educational programs or courses specially targeting relevant knowledge areas.

It should be noted that many of the firms that contributed to the ISP project had showed great resourcefulness in developing their knowledge and competence base.

A good example is the firm Hestasport ehf. in Iceland. This firm can be referred to as an importer of knowledge for product development in adventure tourism (river rafting).

For further information see Appendix B of the ISP report and http://www.rafting.is

f) Facilitating entrepreneurial culture: The ISP project has found examples of innovative firms, which are lead by champions of entrepreneurship. It seems reasonable to argue that without at least a certain level of entrepreneurial driving force, sophisticated innovation facilitation systems have an insignificant meaning. This lesson predicts that policy makers

should be able to step out of the customary discussion on strategies, programs, services, etc. Policy makers should also consider initiatives that build on introverted approaches to community economic development, aiming at general capacity building and raising the motivation and self-confidence of potential innovators (e.g. therapeutic programs for encouraging positive or proactive thinking or constructive identity building at the community or community segment level). In some Nordic regions, local partnerships, including the business community, have been established and are reported to be successful in targeting and implementing innovative programmes.

g) Making better use of existing networks: The great importance of various horizontal networking relationships for innovation processes is a clear and consistent finding from the ISP project. "Firm to firm" relations seem to be a very important part of the systemic aspect of innovation processes, as well as firms' interactions with industry associations, clients and suppliers. The policy mandate, in this context, should be to facilitate even better use of these existing networks. Policy makers should aim at giving the above-mentioned players a stronger role in policy processes as well as strengthening their concrete role in the design and implementation of policy measures through specific support programs and development projects (strengthening of public/private partnerships).

A quote from the Finnish ISP country report:

"Other firms were the most important partners for firms in all sectors. The firms in the food industry and electronics cooperated mostly with clients and suppliers, the firms in the food industry also cooperated with other firms in the same branch. The tourism firms cooperated with other firms in producing services and also with suppliers and sponsors."

h) Framework conditions and problems of peripherality: The ISP findings indicate that when discussing the topic of innovation in the periphery the general framework conditions, within each country's economic environment, greatly influence innovation potentials and processes. Strengthening the overall framework conditions for business competitiveness and innovation is a never-ending policy challenge, both in the rural and urban context. An important lesson for policy makers, which can be drawn from the periphery-specific discussion of the ISP project, is the importance of acknowledging that efforts to facilitate innovations and economic development of peripheral regions should not happen in isolation from other more general regional/(rural) development efforts (and vice versa). Here efforts and support to collective capacity building and innovative measures rather than support to individuals and individual firms should be emphasized (LEADER-like approach).

i) Need for continuing research: All of the previous ISP recommendations call for continuing research of the issues of which the recommendations deal with. In this context it is important to note that research within innovation studies has generally not focused on the economic realities of rural regions and small centers in peripheral regions. The ISP project has primarily focused on the perspective of firms in peripheral locations, rather than on the overall perspective of localities, regions, and intermediate policy systems. There is, therefore, a considerable need for broader data gathering and analysis in this field of innovation studies. In further research, the differential cultural, economic and institutional settings in the Nordic countries should be emphasized for the purpose of contributing to cross-national and cross regional learning.

It is important that policy makers acknowledge that policy measures and other development efforts, which aim at facilitating innovation, call for careful planning and design, as well as for an extensive gathering of relevant information. Such tasks evidently should be built on professional research.

What does the ISP project teach us about the systemic aspects of innovations?

Through the ISP project process several types of the so-called systemic aspects of innovation processes have been identified. These systemic aspects take on various forms where the geographical and sectoral underpinnings and influences vary considerably and also blend together.

One of the key conclusions of the ISP project is that innovation systems are neither solely geographical phenomena nor solely sectoral phenomena. The real life appearance of innovation systems is much more complex than that.

The findings of the ISP project indicate that innovations' dependence on interactions and knowledge transitions, between different economic players, varies greatly between the different examples of innovations studied. Most firms seem to rely strongly on their own initiative, and do generally communicate or cooperate with few selected players. Some firms, however, have a variety of interactions with different players. The systemic aspect is, therefore, in some instances fairly weak, but in other cases stronger.

A common trend across all cases was the importance of various horizontal networking relationships for innovation processes. "Firm to firm" relations seem to be very important and in some cases industry associations play a key role. Also interactions with clients and suppliers seem both to produce new ideas as well as being important in the innovation process. Finally various personal contacts (schoolmates, family, neighbors, friends, etc.) seem to be an important source for information, ideas and advice. Generally we can say that the players listed above, had a stronger role than various official support service providers.

An example of an advanced policy infrastructure was found in the Norwegian case of the tourism sector. For further information on the White book and related Master plan process in branding of Lofoten as tourism product see the Norwegian ISP country report and http://www.lofotradet.no/prosjekter.htm

The bare existence of various support organizations, as well as the perceived effectiveness of these organizations influence the number of cooperative relationships, which firms can be expected to have with such organizations. This was quite evident when comparing the ISP cases, especially within the tourism sector, where some of the study areas enjoyed advanced policy and support service infrastructure while others did not. This relates to the discussion of the importance of having effective arenas for interactions between the economic players in place. This being said, the findings of the ISP project indicate that wide ranging cooperation relationships are not an absolute precondition for innovations to successfully take place. The number of cooperative relationships is probably not what influences the innovation processes the most, but rather how well the established relationships are functioning.

An example of successful educational initiatives, which aim at enhancing innovation, was found in the Danish manufacturing case. In the Salling area in Jutland projects have been carried out in cooperation between local furniture manufacturers and a number of local and national education and governmental institutions.
For further information see the Danish ISP country report and www.skivets.dk, www.eamv.dk, and www.moebelcenter.dk

A final important ISP finding is the fact that, in most cases, R&D agencies as well as educational institutes seem to have an insignificant direct role in the innovation activities of the firms studied. At the same time the level of formal education within the firms (especially within the food industry and the tourism sector) is commonly fairly low. There is, therefore, room for targeted actions to be carried out in collaboration between firms and institutes that focus on general capacity building and education. Such institutes have also an intermediary role, as elements of the innovation system, in linking general capacity building efforts to formal overarching knowledge infrastructure. We argue that further strengthening of such relationships will eventually strengthen innovations in peripheral areas of the Nordic countries.

Executive summary

Hvad handler ISP projektet om og hvilke metoder er der brugt?

ISP projektet "Innovation Systems and the Periphery" er et trans-Nordisk forskningsprojekt, som bygger på den forudsætning, at der er et behov for at øge vores viden om innovationssystemer i udkantsområder og at rette større opmærksomhed mod udformningen og implementering af innovationspolitik og innovationsfremmende praksis i udkantssammenhæng. Projektet fokuserede på innovations rolle og typer af innovationsprocesser i udvalgte industrier i udvalgte udkantsområder i de nordiske lande.

Projektets mål var at undersøge, hvordan virksomheders innovationsevner indenfor udvalgte sektorer i udkantsområder kan fremmes via innovations- og regionalpolitik, samt styrkelsen af innovationssystemer

Case metoden blev valgt som forskningsstrategi. De fire hovedtemaer i undersøgelsen var: Innovationsaktivitet, viden- og kompetencebase, samarbejde og netværk og innovationsbetingelser. Hovedvægten blev lagt på de tre erhvervs/fremstillingssektorer: turisme, fødevareproduktion og fremstillingserhverv. Parterne i projektet udvalgte også et undersøgelsesområde i deres eget land, såvel som et landespecifikt fokus med hensyn til hvilken erhvervssektor, de valgte.

Projektet omfattede 14 cases. For hver case blev de nuværende innovationsforhold kortlagt indenfor hver enkelt erhvervssektor (erhvervsfokus) i det enkelte nordiske område (geografisk fokus). Forskellige tilgængelige informationskilder, for eksempel dokumenter vedr. politik, relevante forskningsrapporter samt statistikker blev gennemgået for hver af de undersøgte cases. Endvidere foregik indsamling af empiriske data ved hjælp af semi-strukturerede interviews med hovedinformanter. Interviewene var baseret på en standardliste med spørgsmål. Som eksempler på hovedinformanter kan nævnes repræsentanter for virksomheder såvel som repræsentanter for regionale og nationale støtteagenter (repræsentanter for udviklingsgrupper, erhvervsorganisationer, uddannelsesinstitutioner, forsknings- og udviklingsorganisationer etc.). Den empiriske dataindsamling foregik i perioden maj til september 2004. Nedenfor ses en liste over de forskellige ISP cases.

Geografisk fokus	**Erhvervsfokus**
1) Ringkøbing og Viborg amter: Danmark	Fødevareindustri: Mejerier og bryggerier
2) Ringkøbing og Viborg amter: Danmark	Turisme: Rekreative serviceydelser, som fokuserer på lokal kultur og miljø
3) Ringkøbing og Viborg amter: Danmark	Fremstillingserhverv: Træindustri (møbler)
4) Central Ostrobothnia: Finland	Fødevareindustri: Mejerier, forarbejdning af afgrøder etc.
5) Central Ostrobothnia: Finland	Turisme: Rekreative serviceydelser, som fokuserer på lokal kultur og miljø
6) Oulu Syd (Nordlige Ostrobothnia): Finland	Fremstillingserhverv: Elektronisk og trådløs teknologi
7) Nordvest region: Island	Fødevareindustri: Mejerier
8) Nordvest region: Island	Turisme: Rekreative serviceydelser, som fokuserer på lokal kultur og miljø
9) Lofoten: Norge	Fødevareindustri: Mejeri og kødproduktion
10) Lofoten: Norge	Turisme: Rekreative serviceydelser, som fokuserer på lokal kultur og miljø
11) Lofoten: Norge	Fremstillingserhverv: Torsk akvakultur (fiskeyngel produktion, produktion og vedligeholdelse af maskiner og udstyr)
12) Dalarna Amt: Sverige	Fødevareindustri: Kød, afgrødeforarbejdning og brødproduktion
13) Dalarna Amt: Sverige	Turisme: Rekreative serviceydelser som fokuserer på lokal kultur og miljø
14) Dalarna Amt: Sverige	Fremstillingserhverv: Træ- og metalindustri

Hovedresultater og politiske anbefalinger

Hovedresultaterne af ISP projektet og de tilsvarende politiske anbefalinger følger herunder. Det bør bemærkes, at på grund af de forskellige nationale og regionale rammer der har været for casene, den brede definition der har været anvendt af hvad innovation er, samt variationen der har været indenfor de virksomheder, der er inkluderet i undersøgelsen (f.eks. med hensyn til størrelse, kompetencer, produktsammensætning, markeder og beliggenhed), bør generaliseringerne af resultater og politiske anbefalinger omgås med forsigtighed. Derfor bør man i begyndelsen af processen med at implementere innovationspolitikker først evaluere resultaterne og anbefalingerne anført nedenfor, og tilpasse dem den relevante nationale og regionale sammenhæng.

a) Anerkendelse af innovationer i udkantsområder: Gennem processen med ISP projektet er identificeret et antal eksempler på "god innovationspraksis". Skønt mange af disse innovationer var små og ubetydelige af natur, demonstrerer disse eksempler at, på trods af nogle åbenlyse ulemper forbundet med placeringen i udkantsområder, er innovation mulig og foregår i de nordiske udkantsområder. Desuden synes innovation ofte nødvendig for at holde en virksomhed kørende og på den måde ses innovation som en overlevelsesstrategi. Det er vigtigt, at beslutningstagere har en positiv holdning overfor innovation i udkantsområder i bred forstand for at skabe en opmuntrende stemning i landdistrikterne. De eksempler, der er fundet ved hjælp af ISP projektet bør styrke sådanne holdninger og opmuntre beslutningstagere til at indtage en proaktiv holdning med det mål at fremme innovation i landdistrikterne.

Eksempler på innovative virksomheder, som deltog i ISP projektet:

- *Thise Mejeri, Danmark http://www.thise.dk/*
- *Listipuu Oy, Finland http://www.lestipuu.fi/*
- *Keldudalur farm Island http://www.keldudalur.is/*
- *Lofilab, Norge http://www.lofilab.no/*
- *Sijlans Chark, Sverige http://www.siljanschark.se/*

b) Udnyttelse og udvikling af landdistriktslivet, således at der skabes innovative produkter: ISP undersøgelsen viser, at traditionel, praktisk viden (f.eks. viden om kulturelle og natur/miljø-aspekter i landdistrikter), som er tæt forbundet med landdistriktsidentiteter, har produceret innovative produkter, som henvender sig til et bredt marked. Dette gælder især for fødevare- og turismesektorerne. Resultaterne i ISP undersøgelsen indikerer derfor, at landdistriktslivet kan anses for at være kilde til innovationer. Beslutningstagere bør anerkende og styrke udnyttelsen af denne kilde ved at lave specielle tiltag (støtteprogrammer, udviklingsprojekter). Sådanne tiltag bør sigte mod at skabe muligheder for innovatorer for at udnytte lokale værdier i produktudvikling og marketing arbejdet og derved trække effektivt på denne kilde.

c) Gennemsigtighed i politiske og offentlige støtteprogrammer: Mange af ISP casene viser at politikker, og i nogle tilfælde tilknyttede støtteforanstaltninger ikke er synlige nok for virksomhederne, som deltog i ISP undersøgelsen. Begrænset opmærksomhed, manglende fortrolighed og i nogle tilfælde manglende tillid til hele innovations-fremme-systemet, synes ofte at karakterisere synspunktet hos repræsentanter for virksomhederne. Som anført ovenfor bør beslutningstagere lægge særlig vægt på at gøre politiske og offentlige støtteprogrammer mere læsevenlige, anvendelige og synlige for slutbrugeren. I denne sammenhæng bør der særligt lægges vægt på det lokale niveau. En sådan understregning burde være en klar del af officielle støtteorganisationers PR rolle. Målet bør være ikke blot at skabe et positivt image for det, men også i virkeligheden et operationelt tilgængeligt og velfungerende innovationssystem. Den fremtidige politiske udfordring omfatter et behov for en understregning af, at traditionelle industrier integreres i nationale og overnationale innovationsfremme-systemer. Dette kræver først og fremmest en tilretning

Et citat fra den svenske ISP rapport:

"Iværksættere i SME i Dalarna møder en sand jungle af støtteagenter på regional, national og EU niveau… Det er vanskeligt – eller umuligt – for SME iværksætteren at få et overblik over hvilke faciliteter og serviceydelser der tilbydes hans/hendes behov."

af de eksisterende, dominerende rationaler for politiske tiltag, som kort kan siges at være stærk støtte til teknologisk og videnskabelig baseret innovation. De tiltrængte justeringer går i retning af anerkendelse af ikke-teknologisk orienteret innovation og ikke-videnskabeligt baseret viden-input til innovation.

d) Opløsning af "sektorielle lock-in": Resultaterne af ISP undersøgelsen indikerer, at i visse nordiske regioner er visse erhvervssektorer temmelig isolerede fra andre aspekter af det økonomiske liv i de undersøgte regioner. Dette gælder specielt for fødevaresektoren, hvor dette viser sig gennem strukturen i støttende serviceydelser, virksomheders netværksmønstre, støtteagenters involvering i tværsektorielle udviklingsinitiativer etc. Det er nok realistisk at forudsige, at fremtidige innovationer indenfor landbrug og fødevarebearbejdning vil kunne drage fordel af tættere relationer til andre specifikke erhvervssektorer (f.eks. turisme) såvel som fra forskellig anden tværsektoriel interaktion og samarbejde (f.eks. med hensyn til branding). Denne melding er vigtig både for virksomheders og støtteagenters virke. Disse resultater indikerer derfor, at der er behov for at vægte tværsektoriel tænkning og interaktion højere, når der skal laves politikker. En sådan tvær-sektoriel politik bør følges af det praktiske arbejde med implementering i form at konkrete programmer eller projekter, som sigter mod en bedre udnyttelse af ikke-fuldtudnyttede muligheder for innovationer.

Et citat fra den norske ISP rapport:

"Overraskende nok er der kun lidt samarbejde og ikke mange formelle netværk mellem fødevaresektoren og turisme-sektoren.

Lokale madruter kan udvikles for at tiltrække både lokale kunder og besøgende…Der kan findes eksempler på, at produkter med en speciel geografisk oprindelse har bidraget til markedsføring af regionen. Et eksempel er Parma skinken og Parma regionen i Italien; det kan måske også ske for nogle produkter i Lofoten?"

e) Udvidelse af viden- og kompetencebasen: Skønt der fremkom forskellige værdifulde typer af viden og kompetencer i ISP casene, kan man hævde, at forbedring af den grundlæggende viden- og kompetencebase i de undersøgte virksomheder, kunne bidrage til innovationspotentialerne i disse virksomheder og de regioner, de virker i. Skønt generel kapacitetsopbygning kan ses som det primære behov i denne sammenhæng, kan vi også argumentere for, at der er behov for at forbedre beholdningen af formel, højtudviklet viden, især blandt de virksomheder og industrier, som har nået et vist niveau af modenhed og avancerethed. Beslutningstagere bør sigte mod en styrkelse af den rolle, uddannelsesinstitutioner spiller i udkantsområder. Et sådant engagement kan f.eks. være i form af samarbejdsprojekter, som inkluderer parter fra lokale/regionale udviklingsgrupper eller –organisationer, eller i form af specielle uddannelsesprogrammer eller –kurser, specielt målrettet mod relevante videnområder.

Det bør bemærkes at mange af de virksomheder, som var med i ISP projektet, havde brugt stor opfindsomhed i udviklingen af deres viden- og kompetencebase.

Et godt eksempel er virksomheden Hestasport ehf. på Island. Denne virksomhed kan kaldes importør af viden til produktudvikling i oplevelsesturismen.

Mere information i Bilag B i ISP rapporten og på http://www.rafting.is

f) Fremme af iværksætterkultur: ISP projektet har fundet eksempler på innovative virksomheder, som ledes af førsteklasses iværksættere. Det synes rimeligt at argumentere for, at uden i det mindste et vist mål af iværksætter-drivkraft har avancerede innovationsfremmesystemer kun lidt mening. Denne lære forudsiger, at beslutningstagere bør kunne træde ud af de almindelige diskussioner om strategier, programmer, serviceydelser etc. Beslutningstagere bør også overveje initiativer, som bygger på endogene tilgange til samfundsøkonomisk udvikling, med det mål at opbygge generel kapacitet og højne motivation og selvtilliden hos potentielle innovatorer (f.eks. terapeutiske programmer for at styrke positiv og proaktiv tænkning eller konstruktiv identitetsopbygning på kommunal eller lokal niveau). I nogle nordiske regioner er der blevet etableret lokale partnerskaber, som også omfatter erhvervslivet, og de rapporteres at være en succes mht. at opstille mål for og fuldføre innovative programmer.

g) Bedre udnyttelse af eksisterende netværk: Den store vigtighed forskellige horisontale netværksforbindelser har for innovationsprocesser er et klart og konstant resultat i ISP projektet. "Virksomhed til virksomhed" relationer synes at være en meget vigtig del af det systemiske aspekt i innovationsprocesser, såvel som virksomheders interaktioner med erhvervsorganisationer, kunder og leverandører. Mandatet til beslutningstagerne bør i denne sammenhæng være at skabe bedre adgang til at udnytte disse eksisterende netværk. Beslutningstagere bør sigte mod at give ovennævnte aktører en stærkere rolle i de politiske beslutningsprocesser samt styrke deres konkrete rolle i udformning og inddragning af politiske tiltag gennem særlige støtteprogrammer og udviklingsprojekter (styrkelse af offentlig/private partnerskaber).

Et citat fra den finske ISP rapport:
"Andre virksomheder var de vigtigste partnere for virksomheder i alle sektorer. Virksomhederne i fødevareindustrien og elektronik-industrien samarbejdede mest med kunder og leverandører, virksomhederne i fødevareindustrien også med andre virksomheder i samme branche. Turistvirksomhederne samarbejdede med andre virksomheder om at producere serviceydelser og også med leverandører og sponsorer."

h) Udkantsproblematikkens rammebetingelser og problemer: ISP resultaterne viser, at når der tales om emnet innovation i udkantsområder, så har de generelle rammebetingelser i det enkelte lands økonomiske miljø en meget stor indvirkning på innovationspotentialer og processer. At styrke de overordnede rammebetingelser for virksomhedernes konkurrenceevne og innovation vil altid være en politisk udfordring, både i land- og bysammenhæng. En vigtig lære for beslutningstagere, som kan uddrages af den udkantsspecifikke diskussion i ISP projektet, er vigtigheden af at anerkende, at bestræbelser på at fremme innovation og økonomisk udvikling i udkantsområder ikke skal ske isoleret fra andre mere generelle regional/(udkants-) udviklingstiltag (og vice versa). Her bør bestræbelser og støtte til fælles kapacitetsopbygning og innovative tiltag fremhæves snarere end støtte til enkeltpersoner og de enkelte virksomheder (LEADER lignende tilgang).

i) Behov for fortsat forskning: Alle de nævnte ISP anbefalinger kræver fortsat forskning på de områder, anbefalingerne handler om. I denne sammenhæng er det vigtigt at bemærke, at forskning i innovationsundersøgelser har ikke generelt fokuseret på de økonomiske realiteter i landdistrikter og små centre i udkantsområder. ISP projektet har først og fremmest fokuseret på perspektivet omkring virksomheder i udkantsområder, snarere end på det overordnede perspektiv vedrørende lokaliteter, regioner og mellemliggende politiske systemer. Der er derfor et betydeligt behov for en bredere dataindsamling og analyser på dette område i innovationsundersøgelser. I den videre forskning bør der lægges særlig vægt på forskellene i de kulturelle, økonomiske og institutionelle rammer i de nordiske lande for at lære mere tværnationalt og tværregionalt.

Det er vigtigt at beslutningstagerne indser, at politiske tiltag og andre udviklingsbestræbelser, som sigter mod at lette innovationsprocesser, kræver omhyggelig planlægning og udformning, såvel som en omfattende indsamling af relevant information. Det er klart at sådanne opgaver bør baseres på professionel forskning.

Hvad kan vi lære af ISP projektet mht. systemiske innovationsaspekter?

I ISP projektet er flere forskellige typer af de såkaldte systemiske aspekter i innovationsprocesser blevet identificeret. Disse systemiske aspekter antager forskellige former, hvor de geografiske og sektorbestemte understøtninger og påvirkninger varierer betydeligt og også blandes sammen.

En af hovedkonklusionerne i ISP projektet er at innovations-systemer hverken er udelukkende et geografisk fænomen og heller ikke udelukkende et sektorbestemt fænomen. Virkelighedens innovationssystemer er meget mere komplekse.

Resultaterne i ISP projektet indikerer, at innovationernes afhængighed af interaktioner og videnoverførsel mellem

forskellige økonomiske parter varierer meget blandt de forskellige eksempler på innovation, der er blevet undersøgt. De fleste virksomheder synes at have en stor tiltro til deres eget initiativ, og de kommunikerer eller samarbejder generelt kun med nogle få udvalgte aktører. Men nogle virksomheder har mange forskellige interaktioner med forskellige aktører. Så det systemiske aspekt er derfor i nogle tilfælde temmelig svag, men i andre tilfælde stærk.

En generel tendens i alle casene var den relativt store betydning forskellige horisontale netværksrelationer har for innovationsprocesser. "Virksomhed til virksomhed" relationer synes at være meget vigtige og i nogle tilfælde spiller erhvervsorganisationer en vigtig rolle. Også interaktion med kunder og leverandører synes både at producere nye ideer (det, der driver innovation) lige såvel som de er vigtige i den overordnede innovationsproces. Sluttelig synes forskellige personlige kontakter (skolekammerater, familie, naboer, venner, kollegaer osv.) at være vigtige kilder til information, ideer og rådgivning. Generelt kan vi sige, at ovennævnte aktører spillede en større rolle end forskellige offentlige støtteydere.

Et eksempel på en højtudviklet politisk infrastruktur ses i den norske case i turistsektoren. For mere information om Hvidbogen og den dermed forbundne Master plan proces med branding af Lofoten som turistområde se den norske ISP rapport og http://www.lofotradet.no/prosjekter.htm

Den blotte tilstedeværelse af forskellige støtteorganisationer, såvel som opfattelsen af effektivitet i disse organisationer har indflydelse på det faktiske antal af samarbejdsrelationer, som virksomheder kan forventes at have med sådanne organisationer. Dette var helt åbenlyst ved sammenligningen af casene i ISP projektet, især indenfor turistsektoren, hvor en del af undersøgelsesområderne nød godt af højtudviklet politisk infrastruktur og støtteforanstaltninger, mens andre ikke gjorde. Dette relaterer sig til diskussionen om vigtigheden af at have effektive rum til interaktioner mellem de økonomiske aktører på plads. Når det er sagt, må man også sige at resultaterne i ISP projektet indikerer, at det bør understreges, at et stort, bredt udvalg af samarbejdsrelationer ikke en absolut betingelse for at succesrige innovationer kan forekomme. Antallet af samarbejdsrelationer, som hver virksomhed har med andre agenter, er sikkert ikke det, der påvirker innovationsprocesserne mest, men snarer hvor godt de etablerede relationer virker.

Et eksempel på vellykkede uddannelsesinitiativer, som sigter mod at fremme innovation, blev fundet i den danske case indenfor fremstillingserhverv. I Sallingom-rådet i Jylland er der gennemført projekter i samarbejde mellem lokale møbelproducenter og et antal lokale og nationale uddannelsesinstitutioner og offentlige institutioner.
For mere information se den danske ISP rapport og www.skivets.dk, www.eamv.dk, og www.moebelcenter.dk

Et sidste vigtigt resultat i ISP projektet er, at i de fleste tilfælde synes forsknings- og udviklingsenheder samt uddannelsesinstitutioner at have en ubetydelig direkte rolle i innovationsaktiviteterne i de undersøgte virksomheder. Samtidig er det formelle uddannelsesniveau i virksomhederne (især indenfor fødevareindustri og turistsektoren) generelt temmelig lavt. Der er derfor plads til en målrettet indsats i et samarbejde mellem virksomheder og institutioner, som fokuserer på generel kapacitetsopbygning og uddannelse. Sådanne institutioner har også en formidlende rolle som et element i innovationssystemet som de, der sammenkæder generel kapacitetsopbygning med den formelle, højere uddannelses- og viden-infrastruktur. Vi vil hævde at en yderligere styrkelse af sådanne relationer efterhånden vil styrke innovationer i udkantsområder i de nordiske lande.

Project synthesis

1) Background of the ISP project

It is now widely believed that economic performance of firms, organizations, industries, and economic regions is heavily based on the capacity to innovate[1]. It has furthermore been argued that there is a need to understand innovation in a broad sense. Firms progress by identifying or discovering new and better ways to compete in an industry and bringing them to market[2]. Innovation can, therefore, be triggered by the need for adapting to change or sustaining competitive advantage. Such a broad understanding of innovation includes not only R&D demanding and high-tech based processes, but also new ways of production, new ways in management and marketing and more effective networking relationships between firms and between the private and the public sector[3]. This broad understanding of the concept of innovation also calls for the recognition of different types of knowledge and competences as the necessary building blocks for innovation. These include not only the commonly emphasized laboratory and technology know-how (science based knowledge) but also various forms of practical knowledge, which for example is a key underpinning for most traditional and mature industry sectors.

The contemporary discussion of innovation, in the context of regional economic development, commonly focuses on densely populated, so-called technology-advanced regions. In the Nordic context the capital regions and major university centers have often been in focus of research. Innovation policy is often seen as contributing to city growth, undermining population in rural areas. Less attention has been paid to the role of innovation in economic development of traditional and mature industries, in rural and/or peripheral regions, and to the integration of these industries in national systems of innovation. The ISP project builds on the premise that there is a need for increasing our knowledge of innovation systems in the periphery and to pay an increased attention to the design and implementation of innovation policy and innovation facilitation practice in the rural context.

Key concepts

The meaning of the term *innovation* is of great importance for the ISP project. The ISP project approached the term from a fairly broad viewpoint, recognizing different types of knowledge and competences as the necessary building blocks for innovation and accepting a broad range of activities as part of innovation processes. After exploring several concrete definitions of the concept of innovation, the ISP research team decided that the following definition would be used in the ISP project:

An innovation means implementing/utilizing a novelty for the purpose of strengthening or improving the competitive status of the entity (firm) in question. Example of this is when a firm introduces a new or significantly improved product (good or service) to the market, or when a firm designs or utilizes a new or significantly improved process or method.

Innovation is based on the results of new technological development, new combinations of existing technology or knowledge, or utilization of other knowledge acquired by the firm.

[1] Edquist 1997; Lundvall 1992; Morgan 1997; Murdoch 2000.

[2] Porter 1990.

[3] Asheim and Cooke 1999; Murdoch 2000.

Innovation is defined from the perspective of each firm, i.e. it has to include something new to the firm; but not necessarily to the market (locally, nationally or in an even wider context). It does, therefore, not matter whether the novelty was developed by the firm or by another entity.

In the ISP research team's view, the definition above can be applied to every industry sector, and to every size of firms in rural and urban locations.

The concept of innovation system has been developed to describe the systemic nature of innovations. It builds on the assumption that innovation is not only a result of, but also reliant on the interactions and knowledge transitions between different economic actors. The term innovation system has been defined as a "*set of institutional actors and interactions, having as their ultimate goal the generation and adoption of innovations at some level of aggregation*"[4] (country, region, industry sector, etc.). The set of players, who represent the different elements of the system are believed to include firms, large and small, as well as various organizations such as educational and research institutes, technology-transfer agencies, consultants and development agencies, public and private funding organizations and interest groups and membership organizations of various sorts. The interactions between these entities (elements) can take place in various ways. They can be described as flows of knowledge and information, flows of investment funding, flows of authority or leadership and even as more informal arrangements such as networks, associations, and partnerships.

The concept of innovation system was put at the center of the ISP project. Although the understanding of the concept, which is reflected in the paragraph above, generated the basis for ISP research approach, the role of the individual firm was emphasized. The exploration of innovation processes within individual firms, therefore, formed the launching platform for the project's analysis.

Focus of the project

The ISP project focused on the role of innovation and the nature of innovation processes in selected industries in chosen peripheral areas/regions of the Nordic countries. The project's goal was the following:

To explore how innovation capabilities of firms, in selected industries in periphery regions, can be enhanced through the means of innovation and regional policy, and the strengthening of innovation systems.

The project's main goal was addressed by examining a set of key variables. The gathering and analysis of empirical data was structured around four categories of variables, referred to as the project's four key research themes. These were: 1) innovation activity, 2) knowledge and competence base, 3) cooperation and networks, and 4) innovation conditions.

For the purpose of narrowing down the focus of the project, an emphasis was put on certain industry sectors. The importance of different industry sectors varies among the Nordic countries. Therefore, when selecting the sectors of emphasis, sectors that were regarded of importance to periphery areas of all participating countries were put at the center. The following industry sectors were selected: Tourism, agri-food production and manufacturing. The study included five cases on the tourism sector, five cases on the agri-food sector and four cases on the manufacturing sector. For each case, each of the research partners formed their country-specific focus, although common criteria were used as a basis.

[4] Saviotti 1997. p. 180.

Each of the research partners also selected an area within their home country to use as a study area. The study areas were to be located in a considerable driving distance from major urban areas, correspond to national definitions for rural regions, and lack a major university/research center. Furthermore, the chosen industry sectors were to be of importance to the study areas economic structure. After applying the industry focus criteria to the selected study areas, the research partners selected the following cases to be part of the ISP study:

Study areas	Focus of cases
Ringkøbing and Viborg Counties: Denmark	Agri-food production: Dairy- and brewing industry
Ringkøbing and Viborg Counties: Denmark	Tourism: Recreational services that focus on local culture or natural environment
Ringkøbing and Viborg Counties: Denmark	Manufacturing: Wood industry (furniture)
Central Ostrobothnia: Finland	Agri-food production: Dairy industry, crop processing, etc.
Central Ostrobothnia: Finland	Tourism: Recreational services that focus on local culture or natural environment
Oulu South (Northern Ostrobothnia): Finland	Manufacturing: Electronics and wireless technology
Northwest region: Iceland	Agri-food production: Milk production and the dairy industry
Northwest region: Iceland	Tourism: Recreational services that focus on local culture or natural environment
Lofoten: Norway	Agri-food production: Dairy- and meat production
Lofoten: Norway	Tourism: Recreational services that focus on local culture or natural environment
Lofoten: Norway	Manufacturing: Production and maintenance of machinery and equipment for the fishing industry and the aquaculture industry and development and testing of technologies for fry production
Dalarna county: Sweden	Agri-food production: Meat, crop processing and bread production
Dalarna county: Sweden	Tourism: Recreational services that focus on local culture or natural environment
Dalarna county: Sweden	Manufacturing: Wood and metal industry

Methodology

A case study approach was chosen as a research strategy for the ISP project. Each of the cases explored the contemporary phenomenon of innovation within a single industry sector in a single Nordic area. The research approach, therefore, focused on understanding the dynamics present within a number of defined settings. It should be stressed that a case study is not a survey, where reliability relies on the characteristics of the data collection tools, the sampling techniques and the sample size. It should also be emphasized that when choosing the types of research tools for the project and when designing the actual tools and procedures, the intention was not to collect data for statistical inference. The case study approach, however, allows for systemic analysis of each case and the identification of common themes, patterns and trends, among the cases. The approach can, therefore, be used for producing analytical conclusions and interpretations.

A set of semi-structured interviews with key-informants was carried out for each of the cases. The interviews were based on a standard list of questions. Examples of key-informants included representatives of firms in the chosen sectors, as well as representatives of regional and national support agents (including representatives of development groups/corporations, industry associations, educational institutes, R&D organizations, etc.). The empirical data gathering took place in the period of May to September 2004. During this time the

researchers visited the chosen study areas and the interviews took place in different communities within them.

2) Sector-based summary of case study findings

Agrifood production (primary production/farming)

Innovation activity

Innovation activities found at the farms studied can most commonly be categorized as process innovation, e.g. installations of various new technological equipment, and procedures. "On farm sales" and internet sales are also a new trend (seen in a number of cases). Innovations are mostly incremental and encompass implementation of novelties that commonly can be considered new to the farm ("in-house" level) rather than new on the regional and/or national level, although examples of such were found as well. Basic expansion, resulting in more efficient operations, is the most common goal of innovation activities, although improvements of working conditions or labour reduction is also an important element. This is in line with the general trend towards fewer and larger farms, which is taking place in all of the Nordic countries. Innovation activity appears to be directly linked to the age of the farmer (the younger being more active).

Knowledge and competence base

With only few exceptions, innovation activities at the farms studied, seem to be based on specific practical knowledge generated primarily by experience rather than within the formal education system. Personal competences, such as entrepreneurial spirit, also seem to be a key component of the knowledge and competence base, which innovations develop from. Although some of the farmers interviewed are quite active in seeking new knowledge. This is most often not directly linked to innovation projects, but rather to the every day activities on the farm (e.g. accounting or computer courses, etc.). This is not surprising, given the incremental nature of most of the innovation projects, which the study found on the farms visited. In most cases there is sufficient supply of various educational programs for farmers. The challenge seems to be to coordinate the different programs and to attract farmers to participate (see for example the findings from the Danish case). In some instances educational offerings and the farmers' participation seem to be locked within sectoral systems, which might limited the farmers' utilization of programs of value for alternative farm activities or for broadening the basic knowledge base (see for example the results from the Icelandic case).

Cooperation and networks

Overall, the farmers interviewed seem to utilize a fairly broad range of networks and contacts. The types of interactions are quite varied (e.g. informal with colleagues and personal contacts, but formal with financial institutes). The key contact persons of farmers in relation to innovation processes (found in all cases) are other farmers (colleagues) and other personal networks, suppliers (e.g. of new equipment), and regional farming advisors. Industry associations and financial institutes are also commonly mentioned as important players in innovation processes on farms. Research institutes and universities/colleges have an insignificant role in innovation activities on farms. However, there are considerable indirect linkages through intermediary regional farming consultants in place. Cooperation and

networking primarily takes place at the local and regional level and networks seem to be primarily sector oriented.

Innovation conditions

Despite the dissimilarities between the business environments of farms, in different Nordic countries, it can be argued that farming in all of the countries exists in a fairly rigid environment. The business environment is characterized by extensive policies and regulations, official production systems (at least for some branches of farming), traditional market structures, and long-standing social networks. This basic nature of the industry greatly affects innovation opportunities and innovation processes within the industry. Innovation outlook for the farming sector can be described from a twofold perspective. Firstly, there are indications towards a continuing trend of larger and more efficient farm operations, including additional equipment and process renewals. Secondly, the outlook includes a trend towards the development of alternative farm products and farm procedures. Examples of this are organic production (e.g. becoming an important aspect of Danish farm production) and other types of niche production and marketing. Also activities that have to do with "on farm processing" have received increased attention (e.g. evident in the Norwegian and the Swedish cases). This encompasses some opportunities for production of various delicatessen and increased linkages with "farm visits" and other tourism activities.

EU Common Agricultural Policy (CAP) contributes to innovations in particular within Pillar 2, i.e. the Rural Development Policy, stimulating innovations particularly in environmental practices at the farm level. However, the market support scheme, Pillar 1, counteracts innovations in the agricultural sector and is much larger in terms of funding. For a discussion on this and the policy implications, we refer to "The Territorial Impact of CAP and Rural Development Policy", ESPON Project 2.1.3 Final Report (www.espon.lu).

Agrifood production (processing)

Innovation activity

Many types of innovation activities/projects were found among the processing firms included in the ISP study. Product innovations are the most evident, although various forms of process innovations as well as marketing innovation were also found. Some of the innovations were small, incremental, "in-house" innovations, but innovations that encompassed something new to regional or national markets were also found. Innovation, seen from a broad perspective, commonly seems to be looked upon as a survival strategy. The purpose of innovation activities is, therefore, commonly to increase (or simply sustain) revenues by, for example, broadening product ranges, directing the production towards more "value-added" products, or by increasing efficiency through process and/or technology advancements.

Knowledge and competence base

Although the knowledge and competence base of the processing firms visited, varied quite a bit between firms and cases, overall we can say that various forms of practical knowledge, trade- and craftsmanship, certain types of technical know-how, and gained experience are the most evident building blocks for innovation in the food processing industry. University education (at the management level) is also important part of the knowledge base of the larger firms, especially in the Danish and Swedish cases, but not as evident with the smaller firms.

The firms generally have limited contact or cooperation with research and educational institutes, and firm representatives generally did not express evident needs in that direction. This applies especially to the Norwegian, Finnish and Icelandic cases and to some extent to the Danish case, where new knowledge is often accessed and developed either through initiatives organized by industry groups and/or associations or developed internally, for example through apprenticeship contracts, recruitments, or by "learning by doing". The primary common needs (identified across all cases) for development of the knowledge and competence base, were needs for more extensive knowledge on markets, marketing and sales (trend-spotting, niche development, pricing, etc.). In some instances there is also a need for increased knowledge on product development, general management, and in the field of quality management.

Cooperation and networking

The intensity of cooperation and networking, as well as the types of interactions of the firms with other agents in their environment, varied considerably among the firms included in the study (also within each case). The findings from all cases show that firms cooperate on various geographical levels; some only at the local/regional level, but others possess a mixture of networking relationships on the local, regional, national or even international levels. Ideas for innovation activities, most commonly originate (found in all cases) from within the firms themselves ("in-house"), from suppliers (sellers of equipment, packaging, etc.), or from market agents (other firms/competitors, customers, etc.). When looking at common findings among all cases, these are also the agents that the firms most commonly partner or cooperate with in relation to innovation projects. Personal contacts of various sorts (friends, neighbours, school mates, etc.) are also important players in the innovation processes of the firms studied. In addition, industry associations have an important role in the Danish and Icelandic cases, and regulatory authorities have an important role in the Danish and Swedish cases. Cooperation with research and development agencies generally seemed to be fairly uncommon (except for in the Danish case).

Innovation conditions

The overall external conditions of the firms visited in the different study areas, varies noticeably. Apart from geographical differences, considerable dissimilarities are caused by the different status of the Nordic countries in the European context; Denmark, Sweden, and Finland being EU member states, while Iceland and Norway are not. This influences both market related trends, as well as the structure of development and support programs. Many of the findings, especially from Denmark and Sweden, have to do with recent trends on the European market. An increased threat, posed by foreign food corporations buying out successful family firms, is one example of such findings from the Swedish case. The relocation of large food processing companies, away from Danish rural areas, is another such example in the Danish context. Another finding from the Swedish case reveals that the increasingly fierce competition on the European market has forced innovation in product development and marketing within the Swedish agrifood industry. Opportunities for market innovations have presented themselves for example in the form of introduction of traditional Swedish products to foreign markets (i.e. knäckebröd). In fact the Swedish agrifood industry has experienced considerable increase of revenues from agrifood exports in recent years. At the same time the main barrier for further development and innovations found in the Icelandic

case is the smallness of the domestic market and the inability of the Icelandic agrifood industry to compete on foreign markets, given the current position in market alliances. In this context, we should stress that the ISP project does not build on sufficient data to make any supporting or rejecting arguments on the extensive dilemma on inclusion or non- inclusion of Iceland and/or Norway in the European Union. However, based on the ISP findings, it seems clear that the firm representatives from Sweden, Denmark and Finland, which were included in the study, expressed a somewhat more positive outlook towards the future innovation potentials of the agrifood industry, than their counterparts in Iceland and Norway.

Tourism

Innovation activity

Abundant examples of innovations were found in the five cases on the tourism sector. Most of the innovation projects encompass novelties on the regional or national level, although small incremental "in-house" innovations were also found. The nature of the innovations was quite wide-ranging; having to do with the initiations of new products and processes, as well as implementations of new marketing strategies that often target new groups of customers. The study focused especially on firms, which at least partly focus on recreational services. Examples of innovative projects, found in the cases, include extensive product developments (e.g. focusing on wilderness experiences and action-based activities such as winter sports, sailing, river rafting, horse-back riding, etc.), and renewals of strategies/processes (e.g. focusing on destination development or Internet marketing). Although varying from firm to firm, the primary goal of innovation activities is expansion (increased revenues). Many of the tourism operations in the study areas are quite small and are struggling to become large enough to be considered profitable. Since the great differences in the number of tourist visits, between the low- and high season, is a great challenge in most of the study regions, the innovation projects also commonly aim at extending the tourism season.

Knowledge and competence base

Multitalented entrepreneurs that possess various forms of practical knowledge and competences generally operate the tourism firms, which were studied. The individuals who run and work in the smaller firms generally do not possess extensive formal education at the university level, but commonly appear as energetic individuals with varied occupational experiences. The larger, and often more mature firms, more commonly possess professional knowledge and competences e.g. concerning hospitality services, language skill, relevant certifications (e.g. official guide certification), etc. Overall, degrees or diplomas in tourism studies and/or management seem to be quite rare. An important finding, across all five cases, is the importance of knowledge of the local environment (including social, economic, cultural, and natural aspects). In all cases the tourism concept within the study regions is partly built on utilization of such existing knowledge. This is especially evident in the Norwegian case study. The firm representatives did not generally express great needs for improving the firm's knowledge and competence base. Also those few needs expressed were quite varied. The support agents, however, did generally not have any difficulties in identifying various needs in this regard, but these were also quite different among the cases. However, the need for increased marketing- and sales know-how is probably the most commonly mentioned need by both firm representatives and supporting agents, across cases. Generally, access to new knowledge is perceived to be at least moderately good by the

representatives of the tourism industry, who contributed to the project. However, some of the cases (e.g. the Danish one) found examples of perceived barriers when it comes to access to specialized new knowledge and competences, which usually are only accessible in major, urban centers. In this regard it is the physical distance that can cause a problem, since especially the smaller firms have difficulties finding the time and resources for traveling.

Cooperation and networks

The innovation processes, found among the tourism firms visited, varied considerably, concerning the key contributors and the networking activities associated with the processes. When looking for common similarities among cases we can say that among the smaller and younger firms, the regional level seems to be the most common source of partners and contacts, while the larger and more mature firms as well as those that have been referred to as the "frontrunners" (or innovation champions) prefer to look abroad for ideas and contacts (see e.g. the findings from the Danish and Icelandic case). Personal contacts of various sorts (e.g. friends, family, colleagues, etc.) generally seem to be among the most common contacts, which firms interact with in relation to innovation processes. The level of interaction between the firms and suppliers and customers (including travel agencies), in relation to innovation projects, is also at least moderately high in all cases. The third communality among all cases is a relatively low interaction level between the firms and research and development agencies. The level of interaction between the firms and other firms (competitors) varies somewhat, although the findings of the Danish, the Swedish, the Norwegian cases, and to some extent the Finnish case, reveal quite extensive interactions in this regard. The Danish, Swedish and Norwegian firms, which contributed to the project, furthermore, generally indicate a high level of interaction with interest groups of various sorts. Industry associations also seem to have a role in the firms' innovation activities. In all cases firms were found that had considerable interactions with an industry association, although the Norwegian case revealed somewhat stronger relationships in this regard than the other cases.

Innovation conditions

As seen by the paragraph above, the overall intensity of cooperation and networking of the tourism firms studied, as well as the types of interactions associated with it, varied considerably. It seems reasonable to argue that the appearance of cooperation and networking, as revealed by the five cases, has a lot to do with the overall development stage of the tourism as an industry sector in the study areas in question. Tourism, as an organized industry, seems to be a firmly established part of the "economic landscape" especially in the Norwegian case, but also in the Swedish and the Danish cases. This is quite apparent in regard to official policy development, the supply of support services and development grants, and the tradition for active industry associations. Meanwhile the Finnish study shows that tourism has not yet gained ground as a structured industry sector in the region studied. Also the findings of the Icelandic case indicate that even though tourism has greatly developed in the last two decades, the industry structure and coherence could still do with some improvements. It seems evident that the development stage of the industry sector as a whole must affect innovation in the study regions. The Norwegian case, for instance, appears to be an excellent example of successful development of a formal and coherent industry structure, including a historical record of cooperation and networking, especially on the policy level, but also on the firm level, and a structure for multifaceted development efforts. This has resulted in a

coordinated destination development with an input from a broad range of stakeholders. It seems reasonable to argue that this situation has and will be of benefit to innovation in the sector in the region.

In spite of the positive picture presented in the Norwegian case, the visibility of the policy structure and various support programs, to the firms included in the Norwegian study, could do with some improvement. In fact this seem to be a common trend throughout all cases, i.e. official policies and support services do not have a strong presence among the firm representatives interviewed, in some instances limiting the application and effectiveness of the overall development systems. In some cases there also seem to be lack of certain support measures (e.g. development grants in the Icelandic case). In fact, with the exception of the Swedish and Finish case, all cases found some examples of frustration towards the lack of development funding and/or the high cost of finance. Although, the findings of the Swedish case are quite positive in this regard, there are, however, also some challenges apparent for the Swedish situation. Although there seems to be a great availability of various support programs and services on the regional, national, and supranational level, the transparency of the service system seems to be quite poor. In fact the support system has been referred to as "a virtual jungle of supporting agents at regional, national and EU level". The findings of the Swedish case indicate that firms can have a hard time finding their way within this jungle.

Manufacturing

As is quite evident form the different ISP country reports, the research context of the four manufacturing cases varied greatly. We have, therefore, chosen to present the key conclusions of each of the manufacturing cases separately below.

The case on the furniture industry in the Salling Area of Denmark

The sector in general is very international and thus facing increased competition from furniture producers abroad, especially in Eastern Europe, it has relative low research and innovation rates and has few new products ready for marketing, it makes limited use of the competences of the workforce and has a relative weak formal level of education of employees and management. The industry in general in Denmark lacks resources for innovation, especially funds and competences in design and marketing etc. The firms in the Salling furniture cluster seem, nevertheless, to be very active with innovation strategies of incremental product development and design, together with cost-reductions and outsourcing. The challenges of the sector are met by support to education and competence-building in design and innovation. The companies are highly dependent on market information and express a need for knowledge and competence-building in this area. The companies also express a need for public support for the funding of research and development activities (tax reduction for expenditures). The companies are located in the Danish periphery because of historical reasons and are international in outlook and markets. In the periphery today, they take advantage of traditions as well as a well-motivated and stable workforce. They have unique skills and competences with regard to process technology and management, but problems attracting higher-educated employees because of tradition and cultural distance to these types of competences as well as geographical distance to design schools, universities, etc.

The case on the production of electronics and wireless technology in Oulu South (Northern Ostrobothnia) of Finland

The selected manufacturing branch was the electronics industry, which has been expanding in the study region since the mid 1990s. The electronics industry relates to the ICT-cluster, but it represents, in some respects, the manufacturing in the Finnish rural areas. In Finland, the big industrial enterprises are dominating the industry and a large amount of SMEs belong to their subcontractors. Vertical integration and the problems of dependency and vulnerability are also typical in many rural areas of mechanical wood and engineering workshops. The mechanical wood industry firms are building the networks through leading firms systems resembling the electronics in Oulu South. However, they can be isolated or located in a rural agglomeration, like in Oulu South.

The studied firms operated mostly in the value chain of wireless technology: contract producers, subcontractors, and component producers. In production firms the degrees of staff varied; vocational degree being the most general. In planning firms the staffs were mostly engineers or technicians. The staffs' technological skills and knowledge of production methods was a basis for innovation. Learning through work was important, especially through client's projects and orders. In addition, projects initiated by local developers were crucial. The firms needed more knowledge and skills on marketing as well as on specific technology.

Organizational and process innovations were most common innovations among the firms. The main contributors for the innovation were clients (other firms in network) and Centria, the R&D unit of the regional polycentric. The background of the innovations was often in the outsourcing process or in the needs of clients. The cost reductions forced the firms to innovate. Human and financial resources as well as the "demands of the time economy" were mentioned as major bottlenecks in innovation processes. The firms pointed to the positive attitude of municipalities and other local actors towards the firms, the local and sector-specific skill pool of workers, the vocational school, polytechnics and Centria. The success of the leading firms and the families around them has encouraged entrepreneurship within the interviewed firms.

In the electronics industry there seemed to be a sector specific (technological) local education and knowledge infrastructure (vocational school, technical college and Centria/research and development unit of the polytechnic), which had been utilized by almost every firm in the sector.

We found some elements of a "local innovation system" in the electronics industry, like a sector specific knowledge infrastructure, firms adapting the specific knowledge, and transfer mechanism (development projects, local development agencies, technology centers). However, this system is integrated in a bigger Northern Finland innovation system with a centre in Oulu.

The case on production of machinery and equipment for the fishing and aquaculture industry and development of technologies for fry production in Lofoten of Norway

In the case of manufacturing (aquaculture), the name of Lofoten has a symbolic significance, as the breeding ground of the Norwegian Arctic Cod. The aquaculture innovation system, however, is national. The local knowledge and competence base is systemic, in the sense that

firms and people through their careers are combining different skills and forms of knowledge (science based, tacit and sticky). In terms of innovation activity the industry is serving a highly innovative customer. Norwegian fish-farming faces both technological and market challenges. The pressure for new innovations is hard. The innovation conditions in manufacturing are characterized by competing interests and conflicting strategies in the national innovation system. Within this context, the Lofilab strategy, which represents radical innovation related to development and manufacture of cod fry, is marginalized. The sector has clear innovation system features locally/regionally, and the system is linked to the national system. While the local/regional system learns from interactive learning between codified and practical knowledge, this type of learning seems to have worse conditions nationally. There is a need for stronger emphasis on interactive learning in national level innovation policy (the linear science-driven model has failed). There exists a formalized network organized at the national and regional level (ARENA), which has members in Lofoten among emerging cod producers. The network is promoting codified – codified relations, mostly between industrialists and the regional university in Bodø. There are also networks in Lofoten on an informal basis, where practitioners exchange information and experiences with cod production. The Lofilab national and international networks on cod fry production include national cod producers, financiers, and the national innovation system. This case provides us with an example of radical innovation in the periphery of Lofoten, supported by locally based key knowledge and competence components. The supporting innovation system is strongest in the national context. The configuration of the system is more directed towards traditional salmon breeding and salmon aquaculture than being supportive towards the radical innovation of cod fry.

The case on the wood and metal industry in Dalarna county of Sweden

The owners and managers of the small enterprises in Dalarna, which the study included, are typically "self-made men" with a long personal experience from the industry, but with little formal training. The key role of the individual entrepreneur/manager of the small firms in acquiring new knowledge and innovating products and processes is evident in all cases. Typically, also the current workforce has low formal education but often a long career as skilled workers. The commitment of the companies' employees is mentioned as a key factor for competitiveness by most interviewees.

The machinery equipment, and the skill to operate and adjust it, constitutes an important competence base for many of these firms. Not seldom the equipment is unique for the particular firm at least in the region and hence a competitive advantage.

More or less all firms declare that firm renewal - introduction of new activities and new products – is a constantly ongoing process driven by the firm manager in direct contact with customers and suppliers. The key facilitators of incremental renewal are often the market agents for machinery equipment, and the banks. In one case, the manager had developed the firm from own innovation (computer system in metal industry) derived from own research. In this case the innovation is new for the world market. Some firms are innovative in terms of design and finish of the products, often developed in close contact with demanding customers.

Informal and person-to-person networks are by far the most important for innovative activity for the small firms in this sector. These networks link the manager with individuals:

colleagues, suppliers, customers and sometimes experts at large companies with R&D capacity in relevant fields. Membership in branch organizations often leads to a general awareness of common challenges for the branch as such. There are several networks connected to the wood industry, which have been initiated spontaneously or with the support of national or EU programmes. Most firms have contacts and mainly positive experiences with the local municipality – both local politicians and business promotion agencies.

There is no general or common perception of the conditions for innovations in these industries, in Sweden or in the region. The local university is not very present in most of the interviewed firm managers' minds. Some say that there is a myth claiming that universities can create new products.

3) Conclusions on the systemic aspect of innovations

Some evident differences were found in the systemic aspect of innovation processes in the 14 ISP cases. In most of the cases the systemic aspect, however, seems to be quite sector-oriented, rather than oriented towards a strictly defined geographical area (region and/or even country). From the overall findings of the ISP project, we therefore conclude that we should be very cautious of using the term *regional innovation systems* to describe the systemic aspect of the innovations found in the study areas.

The basic role of the systemic aspect in innovation processes

The existence of arenas for interactions between economic players that facilitate networking and partnerships and foster a climate of cooperation has been regarded as one of they key factors for the development of a successful regional innovation system[5]. The academic literature suggests that it is particularly important for economic players in rural areas to have strong and diversified networks in place for maximizing their capacity, creating stronger bargaining power and minimizing problems associated with location.

The findings of the ISP project indicate that innovations' dependence on interactions and knowledge transitions, between different economic players, varies greatly between the different examples of innovations studied. Most firms seem to rely strongly on their own initiative, and do generally communicate or cooperate with few selected players. Some firms, however, have a variety of interactions with different players. The systemic aspect is, therefore, in some instances fairly weak, but in other cases stronger.

As noted earlier, the bare existence of various support and service organizations, as well as the perceived effectiveness of these organizations influence the actual number of cooperative relationships, which firms can be expected to have with such organizations. This was quite evident when comparing the different cases of the ISP project, especially within the tourism sector, where some of the study areas enjoyed advanced policy and support service infrastructure while others did not. This relates to the discussion above on the importance of having effective arenas for interactions between the different economic players in place. This being said, the findings of the ISP project indicate that it should be stressed that a wide ranging cooperation relationships are not an absolute precondition for innovations to successfully take place. The number of cooperative relationships, which each firm has with

[5] Cooke and Morgan, 1998; Gregersen and Johson, 1997.

other agents, is probably not what influences the innovation processes the most, but rather how well the established relationships are functioning[6].

The elements of the system and the type of interactions between them

It is relevant to ask: Who were the players representing the key elements of the systemic aspects of the innovations found in the ISP project? Before answering this question, it has to be firmly stressed that the different cases showed some level of variability in this context. However, a common trend across all cases was the relatively great importance of various horizontal networking relationships for innovation processes. "Firm to firm" relations seem to be very important and in some cases industry associations also play a key role. Also interactions with clients and suppliers seem both to produce new ideas (innovation drivers) as well as being important in the overall innovation process. Finally various personal contacts (schoolmates, family, neighbors, friends, colleagues, etc.) seem to be an important source for information, ideas and advice. Generally we can say that the players listed above, had a stronger role than various official support service providers. Also informal interactions seem to be more common than more formal ones.

Another important overall finding of the ISP project is the fact that, in most cases, research and development agencies as well as educational institutes seem to have an insignificant direct role in the innovation activities of the firms studied. At the same time the level of formal education within the firms (especially within the food industry and the tourism sector) is commonly fairly low. Also the firm representatives do neither put much emphasis on the need for new knowledge and competences, nor on the need for stronger linkages with R&D and educational institutes. Although formal scientific knowledge is only in minority of cases an important building block for the innovation activities found by the ISP project, it can be argued that there is a need for that kind of advanced knowledge, especially among the firms and industries that have reached a certain level of maturity and sophistication. However, based on the nature of innovation activities and the current status of the knowledge and competence base, it is reasonable to argue that the most evident need, in this context, is to improve the basic educational base and various practical skills, relevant to innovation activities of the types of firms studied in the ISP project. There is, therefore, without a doubt, a considerable room for a stronger role of institutes that focus on general capacity building. Such institutes have also an intermediary role, as elements of the system, in linking general capacity building efforts to formal overarching knowledge infrastructure.

In this regard it is also important to note that the term "knowledge infrastructure" must be understood in a broad sense, including various support agents (other than solely formal R&D institutes and universities) and various agents operating in the private domain and/or representing the private sector. In some regions of the Nordic countries efforts are already in the making aiming at strengthening the role of educational institutes (including universities) in capacity building within peripheral communities (e.g. activities of some regional universities in Sweden, and distance education programs offered by several universities in Iceland). The findings of the ISP project, however, indicate that there is further potential for collaboration and learning, among a broad range of actors, and that the strengthening of such efforts will eventually strengthen innovations in peripheral areas of the Nordic countries.

[6] This is consisted with some previous findings on this topic in the rural context. See for example Murdoch, 2000.

The level of aggregation

Within the *Innovations Systems Approach*, different types of systems have been defined. A distinction is made between systems which look at a specific industry sector or a specific technology as their starting point and systems which build on some kind of geographical proximity (local, regional, national, etc.). When reviewing the academic literature it is evident that the supporters of the former argue that systems of innovation are more technological than geographical. Those who support the latter emphasize that the local or regional proximity is the relevant context to study. The argument is that national systems may have been important in the past but, partly due to the increasing internationalization of most economic processes, they are losing out to local and regional systems.[7] The ISP project set out primarily from the latter angle, which was presented above. Hence, building on the assumption that an innovation system is a phenomenon that exists in certain geographical space and is shaped by the institutions, which influence economic and social life within that space. However, for the purpose of narrowing the focus of the project, the perspective of firms, within three selected industry sectors, where especially emphasized. In a way the project, therefore, also included a sectoral approach.

The key conclusion of the ISP project in this regard is that innovation systems are neither solely geographical phenomena nor solely sectoral phenomena. The real life appearance of innovation systems is much more complex than that. We have identified several types of the so-called systemic aspects of innovation processes. These systemic aspects take on various forms where the geographical and sectoral underpinnings and influences vary considerably and also blend together.

4) Policy recommendations

Some policy recommendations can be drawn from the key findings of the ISP project. It should be noted that due to the varying national and regional settings for the case studies, the broad definition used of what constitutes an innovation, and the variability of the firms included in the study (e.g. in regard to size, competences, product mix, markets and location) generalizations from the policy recommendations below should be approached with caution. Hence, in the early process of innovation policy implementation, the recommendations listed below should first be evaluated and moderated in the relevant national and regional context.

a) Acknowledgement of innovations in the periphery

Through the ISP project process a number of examples of "good innovation practice" have been identified (see Appendix B for a set of "short stories" of how specific innovations have successfully taken place and/or have been facilitated in the chosen study areas). These examples demonstrate that in spite of some apparent disadvantages, associated with peripheral locations, innovation is possible and taking place in the Nordic periphery. Innovation, furthermore, commonly seems to be considered necessary to stay in business and in that way seems to be looked at as a survival strategy. This confirms that peripheral regions possess firms that already have acquired valuable experiences that they, and others, will be able to build on in the future. The innovations found by the ISP project, furthermore, indicate

[7] See for example Gregersen and Johnson. 1997.

that peripheral regions are not necessarily handicapped in terms of innovative milieus as long as the institutional framework encourages entrepreneurship, competition, and capacity building among firms. It is important to disseminate these experiences to firms in Nordic peripheral areas for the purpose of properly acknowledging and promoting the examples of "good practice". *It is important that policy makers reflect positive attitudes towards the broad topic of innovation in peripheral regions, for the purpose of creating an encouraging spirit in rural communities. The examples found by the ISP project should strengthen such attitudes and encourage policy makers to take on a proactive approach aiming at facilitating innovation in rural regions.*

b) Utilization and evolution of rural ways of life for the purpose of creating innovative products

The knowledge and competence base, which was found in many of the cases (in particular the cases on tourism and agrifood production), includes various forms of traditional practical knowledge, which is interwoven with rural identities. This includes knowledge of social, economic, cultural, and natural/environmental aspects of rural communities. The ISP study shows that this type of knowledge has produced innovative products that appeal to a broad market. This being said, we have also found examples of "new-comers" to peripheral areas, who have been creative in mixing their experiences from other regions and countries with local assets. *The findings of the ISP project, therefore, indicate that the rural ways of life can be a source for innovations. Policy makers should acknowledge and strengthen the utilization of this source by creating specific measures (support programs, development projects). Such measures should aim at generating opportunities for innovators to utilize local assets in product development and marketing efforts and thereby effectively draw from this source.*

c) Transparency of policy- and official support schemes

Many of the ISP cases show that policy, and in some instances associated support services, are not visible enough to the firms participating in the ISP exercise. Limited awareness, lack of familiarity, and in some instances limited confidence towards the whole system of innovation facilitation, commonly seem to characterize the firm representatives' views. In at least some cases it, therefore, seems to be a gap between the official systems and the perceptions and needs of firms. It can be argued that in some instances this is partly due to the limited attention innovation policy has paid to traditional and mature industry sectors (e.g. agrifood production). In other cases this has more to do with the lack of transparency and effectiveness of the system. The policy challenge ahead includes an emphasis on integrating traditional industries into national and supranational innovation facilitation systems. This implies, above all, a need for adjusting the existing, dominating rationales for policy measures, which can be summed up to strongly support technological and science-based innovation. The needed adjustment is in the direction of acknowledging non-science based knowledge as an input to innovation. It is also necessary to ensure that policy spills effectively into the support programs, not only at the national level, but also at the regional and local levels. There is, therefore, a strong need for local and regional innovation facilitators. These agents have an important role in facilitating local trust towards the overarching system. They also have an intermediary role in making policy, and associated measures, visible and accessible to firms in the periphery, as well as in connecting firms with physically distant knowledge producers and other service providers.

As indicated in the previous paragraph, policy makers should emphasize making policy and official support schemes more readable, applicable and visible to end-users. An emphasis should be put on the local level in this context. Such an emphasis should be an evident part of the public relation (PR) role of official support organizations, where the goal should not only be to create a positive image, but merely an operational, approachable and well-functioning policy and support system.

d) Dissolving "sectoral lock-in"

The ISP findings indicate that in some Nordic regions certain industry sectors can be considered quite isolated from other aspects of economic life in the regions studied. This especially applies to the agrifood sector. This isolation, which can be referred to as a "sectoral lock-in", presents itself through the structure of supporting services (including those focusing on knowledge and competence building), networking patterns of firms, involvement of support agents in cross-sectoral development initiatives, etc. It seems realistic to predict that future innovations within farming and food processing will to a greater extent, focus on alternative forms, i.e. be outside the conventional norms of the agrifood industry (e.g. value-added production, including "on-farm" processing and sales, niche production and marketing, farm-based tourism activities, etc.). It can be argued that this focus could greatly benefit from closer relations to other specific industry sectors (e.g. tourism) as well as from various other cross-sectoral interaction and cooperation (e.g. in relation to branding). This message is important both for the operation of firms and support agents. *The ISP findings, therefore, indicate that there is a need to put a greater emphasis on cross-sectoral thinking and interaction in policy making. Such cross-sectoral policy approach should be accompanied by practical implementation efforts in the form of concrete programmes or projects, aiming at better utilizing underexploited opportunities for innovations.*

e) Extending the knowledge and competence base

Although various valuable types of knowledge and competences were found across the ISP cases, it can be argued that improvement of the basic knowledge and competence base, of the firms studied, could contribute to the innovation potentials of these firms and the regions they operate in. Given the nature of innovation activities and the current status of the knowledge and competence base found by the project, there is a need for general capacity building with a focus on various practical skills, relevant to innovation activities. Although general capacity building can be viewed as the primary need in this context, we can also argue that there is a need for improving the stock of formal advanced knowledge, especially among the firms and industries that have reached a certain level of maturity and sophistication. *Policy makers should, therefore, aim at to strengthening the role of educational institutes within peripheral regions, especially their input and involvement in various general capacity building efforts. Such involvement can for example be in the form of cooperative projects including partners from local/regional development groups or agencies, or in the form of specific educational programs or courses specially targeting relevant knowledge areas. In the design of such measures a broad range of educational institutes should have a role and unconventional institutes/players should be included in the design of sector-specific measures (see previous discussion on the need for dissolving "sectoral lock-in").*

f) Facilitating entrepreneurial culture

The ISP project has found examples of innovative firms, which are lead by champions of entrepreneurship. Some of these persons have carried out their innovations, without much interactions or contributions from support programs of any sort. For these firms entrepreneurial spirit seems to be the main driver for innovation, accompanied by a great level of determination and extensive work output. These examples show that entrepreneurial driving force can move mountains. It is also reasonable to argue that without at least a certain level of such a driving force, sophisticated innovation facilitation systems have an insignificant meaning. In spite of increased activities in some Nordic regions (e.g. in Sweden) to promote entrepreneurial spirit and skills, particularly among selected community groups, *the above finding of the ISP project, contains an important lesson for policy makers. This lesson predicts that policy makers should be able to step out of the customary discussion on strategies, programs, services, etc. Policy makers should also consider initiatives that build on introverted approaches to community economic development, aiming at general capacity building and raising the motivation and self-confidence of potential innovators (e.g. therapeutic programs for encouraging positive or proactive thinking or constructive identity building). Such approaches should target different community groups, including different age groups, genders, ethnic groups etc.*

g) Making better use of existing networks

The great importance of various horizontal networking relationships for innovation processes is a clear and consistent finding from the ISP project. "Firm to firm" relations seem to be a very important part of the systemic aspect of innovation processes, as well as firms' interactions with industry associations, clients and suppliers. Partnerships based on a common commercial vision, a local or regional branding and guided by good local leadership have proved to be important. The policy mandate, in this context, should be to facilitate even better use of these existing networks. We should acknowledge the importance of these players, both industry associations and representatives of the private sectors, and ask how they can be better integrated into innovation facilitation systems. *Policy makers should, therefore, aim at giving the above mentioned players a stronger role in policy processes as well as strengthening their concrete role in the design and implementation of policy measures through specific support programs and development projects (strengthening of public/private partnerships).*

h) Framework conditions and problems of peripherality

The findings of the ISP project indicate that when discussing the topic of innovation in the periphery the general framework conditions, within each country's economic environment, greatly influence innovation potentials and processes. Some of the firm representatives, who contributed to the ISP project, were very much concerned with the basic national conditions for running a business (e.g. tax- and labour regulations). The ISP findings also show that the basic challenges associated with peripheral locations do, to a varying degree, affect innovation activities of the firms studied. Challenges associated with geographical distances, for instance, influence firms' access to new specialized knowledge and services, access to labour force with specific qualifications, small regional markets can limit firm networks and expansion opportunities, etc. These hindering factors are especially difficult to overcome for entrepreneurs and small firms, which are early in their business cycle. *Strengthening the*

overall framework conditions for business competitiveness and innovation is a never-ending policy challenge both in the rural and urban context. An important lesson for policy makers from the periphery-specific discussion above, however, is the importance of acknowledging that efforts to facilitate innovations and economic development of peripheral regions should not happen in isolation from other more general regional/(rural) development efforts (and vice versa). Here efforts and support to collective capacity building an innovative measures rather than support to individuals and individual firms should be emphasized (LEADER-like approach). This calls especially for the attention of policy makers, which operate on national and supranational levels.

i) Need for continuing research

All of the previous recommendations call for continuing research of the issues of which the recommendations deal with. In this context it is important to note that research within innovation studies has generally not focused on the economic realities of rural regions and small centers in peripheral regions. The ISP project has primarily focused on the perspective of firms in peripheral locations, rather than on the overall perspective of localities, regions, and intermediate policy systems. There is, therefore, a considerable need for more data gathering and analysis in this field of innovation studies. There is, for instance, a great need for models for local and regional innovation policy, which are not primarily focusing on sectors that greatly rely on advanced technologies and science based research and development. It is also important to explore in depth various general issues of community development and capacity building, and to link those issues with the context of innovation facilitation in the periphery. In further research, the differential cultural, economic and institutional settings in the Nordic countries should be emphasized for the purpose of contributing to cross-national and cross regional learning. *The above contains an important message for policy makers. It is important that policy makers acknowledge that policy measures and other development efforts, which aim at facilitating innovation, call for careful planning, careful design, as well as for an extensive gathering of relevant information. Such tasks evidently should be built on professional research.*

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CHAPTER 1: Introduction

This chapter introduces the background of the ISP project and the key concepts that the project approach is based on. The focus of the project will also be described, including the project's main goal and research themes. The research design will also be discussed, including the selection of industry sectors and study areas and the key aspects of the research methodology. Finally the structure of the report will be explained.

1.1 Background of the project and key concepts

It is now widely believed that economic performance of firms, organizations, industries, and economic regions is heavily based on the capacity to innovate[8]. It has furthermore been argued that there is a need to understand innovation in a broad sense. Firms progress by identifying or discovering new and better ways to compete in an industry and bringing them to market[9]. Innovation can, therefore, be triggered by the need for adapting to change or sustaining competitive advantage. Such a broad understanding of innovation includes not only R&D demanding and high-tech based processes, but also new ways of production, new ways in management and marketing and more effective networking relationships between firms and between the private and the public sector[10].

This broad understanding of the concept of innovation also calls for the recognition of different types of knowledge and competences as the necessary building blocks for innovation. These include not only the commonly emphasized laboratory and technology know-how (science based knowledge) but also various forms of practical knowledge, which for example is a key underpinning for most traditional and mature industry sectors. Evidence from an increasing body of research has documented the deep, complex and systemic knowledge bases of various types of mature industrial activities, demonstrating that increasing knowledge intensity is not limited to so-called high technology industries but is also found across traditional low-technology industries and in SMEs[11].

The contemporary discussion of innovation, in the context of regional economic development, commonly focuses on densely populated, so-called technology-advanced regions, such as the Silicon Valley in California, the Lombardy region in Italy or the Baden-Württemberg region in Germany. In the Nordic context the capital regions and major university centers have often been in focus of research. Innovation policy is often seen as contributing to city growth, undermining population in rural areas. Less attention has been paid to the role of innovation in economic development of traditional and mature industries, in rural and/or peripheral regions, and to the integration of these industries in national systems of innovation. The ISP project builds on the premise that there is a need for increasing our knowledge of peripheral innovation systems and to pay an increased attention to the design and implementation of innovation policy and innovation facilitation practice in the rural context.

[8] Edquist 1997; Lundvall 1992; Morgan 1997; Murdoch 2000.

[9] Porter 1990.

[10] Asheim and Cooke 1999; Murdoch 2000.

[11] Hulst and Olds 1993; Palmberg, Lemola, and Leppälathi 1999; Laestadius 2000; and the PILOT project http://www.pilot-project.org/.

The meaning of the term *innovation* is obviously of great importance for the ISP project. As indicated in previous paragraphs, the ISP project approached the term from a fairly broad view point, recognizing different types of knowledge and competences as the necessary building blocks for innovation and accepting a broad range of activities as a part of innovation processes. After exploring several concrete definitions of the concept of innovation, including the definition used in the Community Innovation Survey methodology of Eurostat, the ISP research team decided that term innovation would be defined in the following way in the ISP project:

An innovation means implementing/utilizing a novelty for the purpose of strengthening or improving the competitive status of the entity (firm) in question. Example of this is when a firm introduces a new or significantly improved product (good or service) to the market, or when a firm designs or utilizes a new or significantly improved process or method.

Innovation is based on the results of new technological development, new combinations of existing technology or knowledge, or utilization of other knowledge acquired by the firm.

Innovation is defined from the perspective of each firm, i.e. it has to include something new to the firm; but not necessarily to the market (locally, nationally or in an even wider context). It does, therefore, not matter whether the novelty was developed by the firm or by another entity.

In the ISP research team's view, the definition above can be applied to every industry sector, and to every size of firms in rural and urban locations.

The concept of *innovation system* has been developed to describe the systemic nature of innovations. It builds on the assumption that innovation is not only a result of, but also reliant on the interactions and knowledge transitions between different economic actors[12]. Innovations, therefore, do not originate as isolated phenomena, but are created by interaction of number of entities or economic players[13]. It can be argued that these economic players represent the different elements of the system. The set of players and the interactions between them are characterized by some specific features that are preserved over time. Corresponding to this, the term innovation system has been defined as a "set of institutional actors and interactions, having as their ultimate goal the generation and adoption of innovations at some level of aggregation"[14] (country, region, industrial sector, technology, etc.). But who are the players, who represent the different elements of the system in a real life context, and what happens through their interactions? Cooke et al[15] suggests that the set of players includes firms, large and small, as well as various organizations such as universities and skill development organizations, research institutes, technology-transfer agencies, consultants and development agencies, public and private funding organizations and interest groups and membership organizations of various sorts. The interactions between these organizations can take place in formal or informal ways. They can be described as flows of knowledge and

[12] Gregersen and Johnson 1997; Lundvall 1992.

[13] Saviotti 1997.

[14] Saviotti 1997. p. 180.

[15] Cooke et al. 1997.

information, flows of investment funding, flows of authority or leadership and even as more informal arrangements such as networks, associations, and partnerships.

The concept of innovation system was put at the center of the ISP project. Although the understanding of the concept, which is reflected in the paragraph above, generated the basis for ISP research approach, the role of the individual firm was emphasized. The exploration of innovation processes within individual firms, therefore, formed the launching platform for the project's analysis.

1.2 Focus of the project

The ISP project focused on the role of innovation and the nature of innovation processes in selected industries in chosen peripheral areas/regions of the Nordic countries.

The project's main goal was the following:

To explore how innovation capabilities of firms, in selected industries in periphery regions, can be enhanced through the means of innovation and regional policy, and the strengthening of innovation systems.

1.2.1 Research themes

The project's main goal was addressed by examining a set of key themes and variables, which originate in the firms' micro and macro environment and can be expected to affect the firms' innovation potential and innovation processes. The gathering and analysis of empirical data was structured around four categories of variables, hereafter referred to as the project's four key research themes. The table below lists the key research themes and the corresponding variables explored.

Theme 1: Innovation activity

1. Appearance of innovation activities (characteristics)
   a. Nature of activities (product/process/market innovation)
   b. Generation and drivers (why do firms innovate, where do ideas originate from?)
   c. Goals/Impacts (why do firms innovate and are the impacts consistent with the intentions?)
   d. Bottlenecks: What are the most common bottlenecks in the innovation process?
   e. Level of novelty associated with innovation activities ("in-house", local, regional, national, international)
2. Future innovation prospects
   a. Do firms have plans for innovation activities?

Theme 2: Knowledge and competence base

1. Status of the k. and c. base:
   a. Inventory: What type of k. and c. is "in stock"
   b. Potentials: What type of k. and c. are the innovation activities most commonly built on? And are these consistent with the inventory (what is lacking?)?
2. Development of the k. and c. base (absorptive/adaptive capacities):
   a. Efforts/interests: How active and interested are firms in dev. the k. and c. base?
   b. Access and barriers: is new k. and c. accessible and what are the most common barriers for developing firms' k. and c. base?

Theme 3: Cooperation and networks

1. Intensity of cooperation and networking associated with innovation activities:
   a. Number of informants/partners and frequency of interactions?
2. Nature of cooperation and networking
   a. Type of interactions (formal/informal?)

b. Geographical dimension (do firms act locally/regionally/nationally, or at the supranational level?) c. Role of different types of innovation players (who participates?)
Theme 4: Innovation conditions 1. The innovation policy situation a. Presence of official policy documents (local/regional, national, supranational level, sector-specific) b. Presence of official indirect measures (projects, programs, services) c. Transparency and legibility of the policy environment 2. Visibility of different aspect of the current policy situation (from the perspective of the project's key informants) a. Local/regional/national/EU policies (if existing) b. Sector specific (if existing) 3. Barriers for innovation or hindering factors a. Nature of barriers (internal/external, types/sorts) 4. Facilitating factors for innovation a. Nature of facilitating factors (internal/external, types/sorts), 5. The role of local cultural environments a. Attitudes towards innovation and entrepreneurship

Table 1: Key research themes and the corresponding variables explored in the ISP project.

1.2.2 Selection of industry sectors

For the purpose of narrowing down the focus of the project, an emphasis was put on certain industry sectors. The importance of different industry sectors varies among the Nordic countries. Therefore, when selecting the sectors of emphasis, sectors that were regarded of importance to periphery areas of all participating countries were put at the center.

The table below lists the industries that the project focused on, as well as the number of cases, which the study included for each sector.

Industries	Denmark	Finland	Iceland	Norway	Sweden	Total # of cases
Tourism	**1**	**1**	**1**	**1**	**1**	***5***
Agri-food production	**1**	**1**	**1**	**1**	**1**	***5***
Manufacturing	**1**	**1**	**0**	**1**	**1**	***4***
Total number of cases	***3***	***3***	***2***	***3***	***3***	***14***

Table 2: Industry sectors that the ISP project focused on and the number of cases.

As seen from the table above, the study included five cases on the tourism sector, five cases on the agri-food sector and four cases on the manufacturing sector. For each case, each of the research partners formed their country-specific focus, although the following common criteria were used as a basis:

Tourism: The focus was put on those aspects of the tourism industry in each study area that could be regarded as having the strongest connection with the area's special characteristics and identity. In that way, operations that utilize special aspects of the area's culture and natural environment were put at the center. In the view of the research team, tourism services, which offer recreational activities rather than accommodation or food-services, were regarded as likely to have the strongest connection with the areas identity. Firms offering recreational services were, therefore, focused on. Furthermore an emphasis was put on locally/regionally

owned firms that build on local/regional branding. No specific scale limits were used in the selection of firms.

Agrifood production: Each of the research partners focused on a branch or branches within agrifood production that could be regarded of key-relevance in the context of the chosen study area (country-specific focus). The cases were to include every link of the value chain; from farming to processing and distribution. In selection of representatives of farms (key informants), the family farm, i.e. farms with staff of less than four people, were focused on. In the selection of processing firms the focus were on firms with less than 100 employees. Finally the focus was on locally/regionally owned processing operations (brands), i.e. at least two links of the value chain were to be operating within the selected study areas (the farms, and the processing plants).

Manufacturing: Each of the research partners focused on a branch within the manufacturing industry that could be regarded of relevance in the context of the chosen study area (country-specific focus). When selecting manufacturing firms (interviewees), firms that represent either local integration or position of rural locations in bigger national clusters, formed the basis of the criteria. The locally integrated manufacturing firms either process local/regional raw material, or supply traditional firms in primary production with essential equipment or supplementary products. These firms are often locally/regionally owned and building on local/regional branding. In those cases where the rural manufacturing could rather be regarded as integrated into national clusters, the focus was put on the role of rural manufacturing firms in the national context. For example, in the Finnish case the focus was on electronics as a part of the national ICT-cluster. In this case the rural electronics manufacturing firms are in a mature phase, while the dynamic parts of the clusters are located in the big growth centers.

1.2.3 Selection of study areas

Each of the research partners selected an area within their home country to use as a study area. The study areas were to be located in a considerable driving distance from major urban areas, correspond to national definitions for rural regions, and lack a major university/research center. Furthermore, the chosen industry sectors were to be of importance to the study areas economic structure. Based on these criteria the following study areas were selected (see table below):

Country	Study areas
Denmark	Ringkøbing and Viborg Counties
Finland	Central Ostrobothnia and "Oulu South" (Northern Ostrobothnia)
Iceland	North West Region
Norway	Nordland county with an emphasis on the Lofoten area
Sweden	Dalarna county

Table 3: The study areas

1.2.4 Research focus

After applying the industry focus criteria to the selected study areas, the research partners selected the following cases to be part of the ISP study (see the table below):

Study areas	Focus of cases
Ringkøbing and Viborg Counties: Denmark	Agri-food industry: Dairy- and brewing industry
Ringkøbing and Viborg Counties: Denmark	Tourism: Recreational services that focus on local culture or natural environment
Ringkøbing and Viborg Counties: Denmark	Manufacturing: Wood industry (furniture)
Central Ostrobothnia: Finland	Agri-food industry: Dairy industry, crop processing, etc.
Central Ostrobothnia: Finland	Tourism: Recreational services that focus on local culture or natural environment
Oulu South (Northern Ostrobothnia): Finland	Manufacturing: Electronics and wireless technology
Northwest region: Iceland	Agri-food industry: Milk production and the dairy industry
Northwest region: Iceland	Tourism: Recreational services that focus on local culture or natural environment
Lofoten: Norway	Agri-food industry: Dairy- and meat production
Lofoten: Norway	Tourism: Recreational services that focus on local culture or natural environment
Lofoten: Norway	Manufacturing: Production and maintenance of machinery and equipment for the fishing industry and the aquaculture industry and development and testing of technologies for fry production
Dalarna county: Sweden	Agri-food industry: Meat, crop processing and bread production
Dalarna county: Sweden	Tourism: Recreational services that focus on local culture or natural environment
Dalarna county: Sweden	Manufacturing: Wood and metal industry

Table 4: Focus of cases in each study area.

1.3 Methodology

A case study approach was chosen as a way to achieve the project's mandate. The case study approach has been defined as "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence"[16]. Another definition refers to the case study approach as "a research strategy which focuses on understanding the dynamics present within single settings"[17]. This research project looked at fourteen cases. Each of these cases explored the contemporary phenomenon of innovation in a single Nordic area.

Various available information, e.g. policy documents, relevant research documents, and statistics, were reviewed for each of the cases explored. Considerable empirical data gathering also took place were standardized methods were used across cases. The key research tools, which were used for collecting empirical data, were structured interviews. When selecting instruments for data collection in a case study research project, it should be kept in mind that a case study is not a survey, where reliability relies on the characteristics of the data collection tools, the sampling techniques and the sample size. Instead, it has been argued that the case study builds on the trustworthiness of the "human instrument" (i.e. the

[16] Robson. 1993, p. 146.

[17] Eisenhardt. 1989, p. 534.

researcher) [18]. Based on this it should be emphasized that when choosing the types of research tools for the project and when designing the actual tools and procedures, the intention was not to collect data for statistical inference. The selection of informants (interviewees), furthermore, was done through the use of non-probability purposive sampling, since the intention was not to make a statistical generalization beyond the selected participants.

The fourteen cases that were explored in the ISP project were based on following key components:

1. Each case focused on one of the selected industry sectors (see Table 2 for list of the chosen sectors).
2. Each case focused on one selected Nordic region/area (see Table 3 for the study areas chosen).
3. A set of semi-structured interviews with key-informants was carried out for each of the cases. The interviews were based on a standard list of questions (an interview guide) across all cases. Examples of key-informants included representatives of firms in the chosen sectors (including representative of firms in primary production, processing, and distribution), as well as representatives of regional and national support agents (including representatives of development groups/corporations, industry associations, educational institutes, R&D organizations, etc.). Table 5 lists the number of interviews carried out in association with each of the cases.
4. The data gathering took place in the period of May to September 2004. During this time the researchers visited the chosen study areas and the interviews took place in different communities within them.

Cases	**Number of interviews**
Ringkøbing and Viborg Counties: Denmark Agri-food production	Firms: 9 Supporting agents: 6
Ringkøbing and Viborg Counties: Denmark Tourism	Firms: 8 Supporting agents: 5
Ringkøbing and Viborg Counties: Denmark Manufacturing	Firms: 6 Supporting agents: 4
Central Ostrobothnia: Finland Agri-food production	Firms: 12 Supporting agents: 5
Central Ostrobothnia: Finland Tourism	Firms: 10 Supporting agents: 5
Oulu South: Finland Manufacturing	Firms: 9 Supporting agents: 4
Northwest region: Iceland Agri-food production	Firms: 10 Supporting agents: 6
Northwest region: Iceland Tourism:	Firms: 8 Supporting agents: 8
Lofoten: Norway Agri-food production	Firms: 8 Supporting agents: 5
Lofoten: Norway Tourism	Firms: 7 Supporting agents: 8

[18] See e.g. Robson 1993.

Lofoten: Norway Manufacturing	Firms: 4 Supporting agents: 4
Dalarna county: Sweden Agri-food production	Firms: 5 Supporting agents: 6
Dalarna county: Sweden Tourism	Firms: 6 Supporting agents: 5
Dalarna county: Sweden Manufacturing	Firms: 6 Supporting agents: 7

Table 5: Number of interviews completed per case.

1.4 Structure of the report

The rest of the report is structured into six chapters. The country-specific contribution of each of the research partners is included in a separate chapter (five chapters in total). All of these chapters are structured in a standard way, allowing for a coordinated approach to the discussion of the project's 14 cases (see the report's table of contents for more details). In the concluding chapter of the report the research context of the project is reaffirmed and the findings of the fourteen cases are summarized and compared. Some specific examples of "good practice" are also presented in the form of "short stories" of activities of specific firms or development groups in the project's study regions. Finally some final conclusions and policy recommendations are put forward. References are listed at the end of each chapter. The report also included appendixes containing additional materials, which are referred to in the concluding chapter.

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CHAPTER 2: Case studies from Denmark

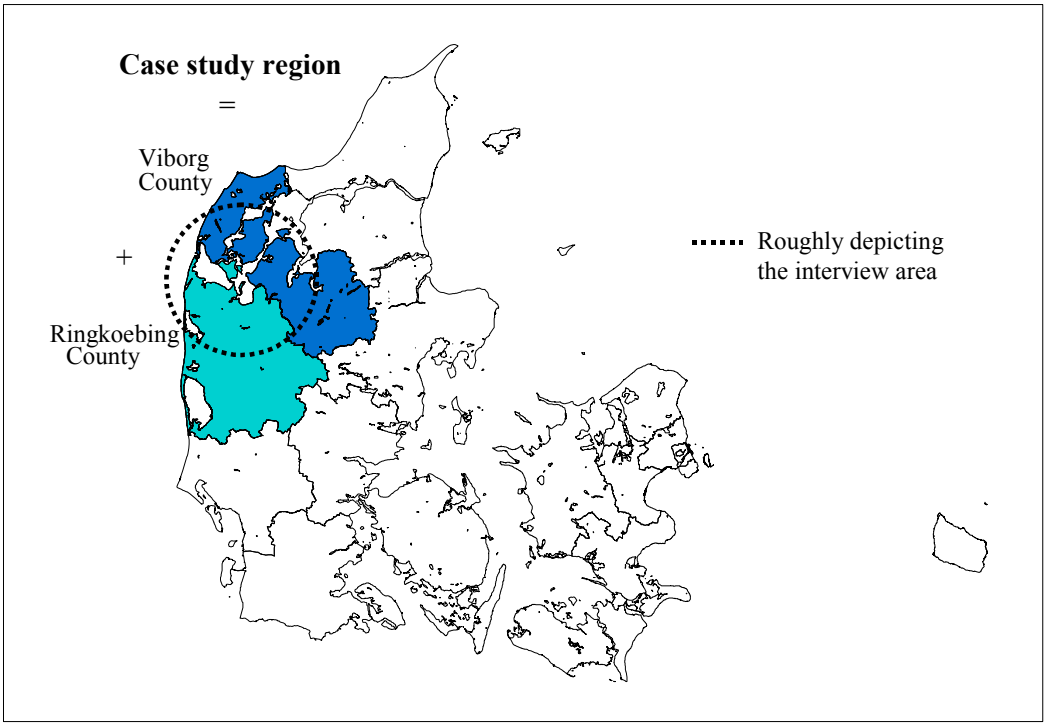
2.1 The research context

2.1.1 The case study region and the selected industry sectors

The case study region selected for Denmark consists of two counties in North West Jutland - Viborg County and Ringkoebing County. The case study region was chosen because it is considered to be peripheral with typical development traits and because of the presence of activities within all three sectors of interest to the ISP project – agri-food, tourism and manufacturing.

Within the region, interviews were carried out in the bordering area between the two counties, cf. Map 1.

Map 1. Case study region and interview area



Apart from having a fairly large food production, this area has some activity within food processing (e.g. dairies and beer breweries). In addition to the summerhouse tourism along the Danish West Coast, some inlet-based tourism activities are revolving around the inlet *Limfjorden*. Finally, manufacturing industry is present in the area, e.g. the furniture industry with a fairly high concentration. Therefore, the following sectors and sub-sectors were selected:

- Agri-food sector: Farmers and among processing firms: dairies and beer breweries;
- Tourism sector: Tourism revolving around the inlet Limfjorden;
- Manufacturing sector: The furniture industry.

The selection of sub-sectors has been guided by a wish to focus on sectors with locally anchored operators whose operation is unique to the area.

The interviewed dairies and beer breweries are thus independent of the nationally dominant companies Arla Foods and Carlsberg. These two companies are also present in the area with various affiliates, but the innovative activities of these affiliates are likely to be determined nationally by their mother companies, and not by peripheral innovation systems.

Coastal mass tourism build around the many summerhouse areas is the most dominant tourist industry in the case study region. However, this is also the case for all other municipalities located at the West Coast of Jutland. Innovation in and around this industry tend to occur on an aggregated level, and innovations, if successful, are likely to spread out to the rest of the industry. It is therefore more interesting to look at tourism activities that are unique to the area – such as tourist activities around the Limfjorden.

The furniture industry is an obvious choice within manufacturing industry. For a long time, the furniture industry has had a stronghold in the area and the vast majority of companies are locally owned and operated.

2.1.2 Rural Denmark

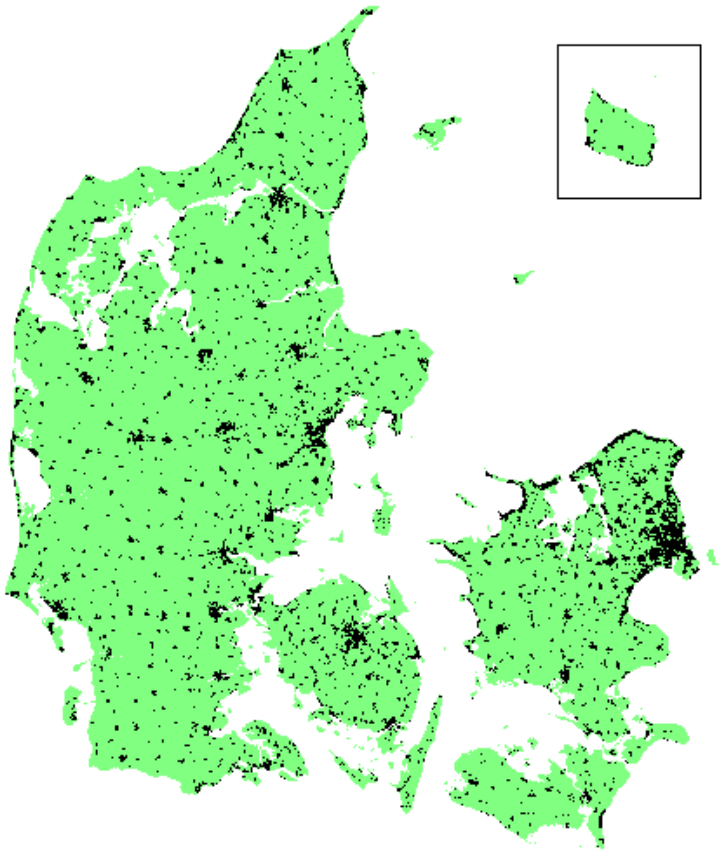
This section will provide a brief overview of the extent and location of rural areas in Denmark. The recent population development will also be shown.

Various definitions of rural areas and regions

Whether an area can be characterised as rural or peripheral depends on the definition. Statistics Denmark uses the distinction between urban areas and rural districts. Urban areas are defined as coherent settlements of at least 200 inhabitants. Rural districts are the areas outside the urban areas. Danish rural districts had about 790,000 inhabitants in 2002, corresponding to 14,8% of the total population[19]. Map 2 shows rural districts and urban areas in Denmark in 2002.

[19]Indenrigs- og sundhedsministeriet (2002).

Map 2: Danish urban areas and rural districts in 2002

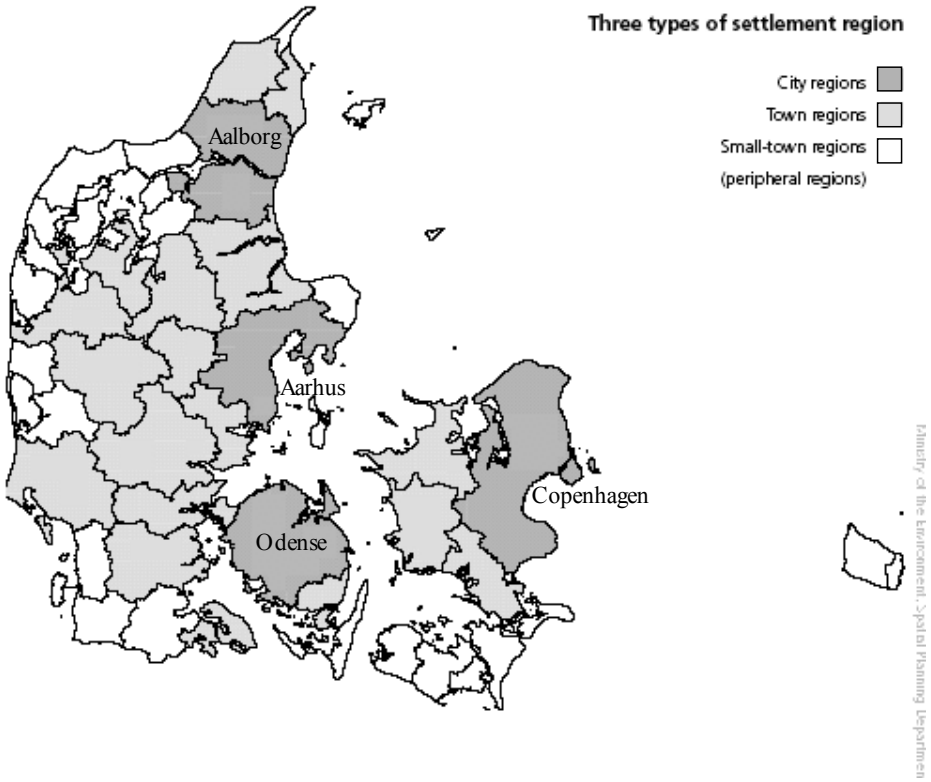


Note: The urban areas marked with black on the map constitute both urban settlement and summerhouse areas.

Source: Indenrigs - og sundhedsministeriet (2002).

In connection with their national spatial planning work, the Ministry for the Environment operates with three types of settlement regions: city regions, town regions and small-town regions, the latter also called peripheral regions. City regions are the commuting regions for Denmark's four largest cities with more than 100,000 inhabitants: Copenhagen and the three provincial cities of Aarhus, Odense and Aalborg. Town regions are the commuting regions for towns with 20,000 to 100,000 inhabitants. Peripheral regions are the commuting regions for towns with less than 20,000 inhabitants.

Map 3. Three types of settlement region



Note: The settlement regions are defined so that at least 80% of the inhabitants have their workplace in the region. The map shows commuting regions as of 1992.

Source: Miljøministeriet (2003).

Map 3 shows the settlement regions in Denmark. The main settlement is found in the four city regions with 55% of the total population. Town regions hold 35% of the total population and, finally, peripheral regions hold 10% of the population. Peripheral regions are mainly made up of smaller islands and some coastal (western) areas in Jutland.

Population development

Table 1 shows the population development in rural areas in Denmark based on the definition of rural districts used by Statistics Denmark.

Table 1. Population development in rural districts and urban areas, 1992-2002

Definition	Type	Share of total population, 1992	Share of total population, 2002	Growth in number of inhabitants, 1992-2002
Statistics Denmark	Rural districts	15.2%	14.8%	1.4%
	Urban areas	84.8%	85.2%	4.5%

Source: Indenrigs- og sundhedsministeriet (2002).

Table 2 shows the population development in rural municipalities by settlement region. Rural municipalities are here defined by the number of inhabitants in the biggest town.

Table 2. Population developments in rural municipalities by settlement region

	Population, 2003 (1,000)	Growth in number of inhabitants, 1990-2003
City regions		
Rural municipalities with < 10,000 inhabitants in biggest town	564	7.2%
Rural municipalities with < 5,000 inhabitants in biggest town	369	5.9%
Rural municipalities with < 2,000 inhabitants in biggest town	68	5.4%
Town regions		
Rural municipalities with < 10,000 inhabitants in biggest town	844	3.3%
Rural municipalities with < 5,000 inhabitants in biggest town	630	3.3%
Rural municipalities with < 2,000 inhabitants in biggest town	216	3.2%
Peripheral regions		
Rural municipalities with < 10,000 inhabitants in biggest town	375	-1.4%
Rural municipalities with < 5,000 inhabitants in biggest town	236	-2.4%
Rural municipalities with < 2,000 inhabitants in biggest town	75	-4.1%
All of Denmark	5,384	4.8%

Source: Miljøministeriet (2003).

Rural municipalities in city and town regions have had a positive population development, whereas rural municipalities in peripheral regions have had a negative one. Almost systematically, the population development goes from a very positive one, over a less positive one, to a more and more negative one, the more peripheral the region gets and the smaller the municipality gets.

The degree of rurality in Denmark in a European context

Denmark is not as "rural" as the other Scandinavian countries. There are no large stretches of more or less uninhabited land like in Norway, Sweden and Finland and you will not find areas with extremely low population densities.

However, Denmark is quite rural compared to other West European countries. This is seen in Table 3, showing the degree of rurality in the 15 old EU member states.

The table is based on an OECD terminology that defines a rural community (or municipality) to be a community with less than 100 inhabitants /km^2. Regions are then distinguished by their degree of rurality depending on what share the population in rural communities make up of the region's total population. Regions are grouped into the three types: predominantly rural areas, significantly rural areas and predominantly urban areas.

Of the 15 countries in Table 3, Denmark is surpassed only by Ireland, Finland and Sweden in terms of rurality. Austria lies more or less on the same level. Denmark clearly has a high score on rurality compared to the average for all 15 countries (EUR-15).

Table 3. Degree of rurality in 15 EU member states

	Population in rural communities (a)	Population by type of regions		
		Predominantly Rural (b)	Significantly Rural (c)	Predominantly Urbanised (d)
	(% of national population)			
Denmark	32.4	39.6	31.3	29.1
Finland	50.6	58.9	41.1	0.0
Sweden	66.8	63.2	17.7	19.1
Belgium	4.9	3.4	4.9	91.7
Germany	12.0	5.4	25.2	69.3
Greece	30.8	28.1	28.3	43.6
Spain	24.4	12.7	41.5	45.8
France	23.7	10.5	56.6	32.9
Ireland	43.1	46.6	15.1	38.3
Italy	14.1	4.1	27.1	68.8
Luxembourg	19.3	-	100.0	-
Netherlands	3.1	0.0	6.7	93.3
Austria	34.6	30.2	28.9	41.0
Portugal	21.2	18.1	22.8	59.1
UK	8.7	1.0	18.7	80.3
EUR-15	17.5	9.7	29.8	60.5

Note:

a) Population of local communities with population density below 100 inhabitants/km^2.

b) Predominantly rural regions: > 50% of the population living in rural communities.

c) Significantly rural regions: 15-50% of the population living in rural communities.

d) Predominantly urban regions: < 15% of the population living in rural communities.

Source: European Commission (1997).

2.1.3 Profile of the study region

The following will give a brief description of the history and present socio-economic structure of the case study region: Viborg County and Ringkoebing County. Both counties are *predominantly rural regions*, using the OECD methodology for types of regions[20].

Development history in short

A few years ago, this part of the country and other western parts of Denmark were the places that had the highest growth rate in employment and local economy due to the late industrial development. For instance, 50,000 new jobs were created between 1960 and 1980 in the production sector, only in the counties of Ribe, Ringkoebing and Viborg. Moreover, a very high number of jobs were created in the local administrative sector due to a strengthening of the decentralised administrative structure, created by a Municipal Reform in 1970. This Reform was followed by a number of other reforms, all with the purpose of implementing the decentralised Danish Welfare State.

By far the most of the new jobs in the production sector were in local small and medium sized industrial companies, either as jobs in new companies or as jobs in expanding older trade companies and the like. This was at a time when former industrial companies in the cities, especially in the eastern parts, had to close down due to overheated labour markets and reorientate production, so that the production tasks could be placed elsewhere and thereby ensure their survival. So in this way tasks were transferred to the areas in the country (and outside the country) where there were idle, enterprising and motivated forces (due to the withdrawal of the agricultural society), and still with a sufficient qualification structure and other infrastructure at their disposal. This is where the effects of the Welfare State come into action[21].

During only a few years, the counties of Ringkoebing and Viborg went through a development from primarily an agricultural society to primarily an industrial society. Still, agriculture plays a relatively bigger role here than in the rest of the country, but does not even come close to neither employment rate in the production sector or for that matter the employment rate in the private and public service sector. Furthermore, the position close to the North Sea has led to streams of tourists, which has again led to activities and employment.

The areas have now changed from having favourable conditions to facing an agenda where the weighty production sector is threatened by the competitiveness of low-pay countries. A coming Structural Reform, dramatically reducing the number of municipalities and jobs in this sector, is also expected to reduce the possibilities of making a living for the inhabitants in the region. At the same time fishing and agricultural sector is still under pressure and the number of jobs here is reduced.

Especially the western parts of the two counties are so far away from the new growth centres - namely the big cities and their hinterlands, especially in the Eastern parts - that loss of jobs

[20] Predominantly rural regions are defined as regions with more than 50% of the population living in communities (municipalities) with less than 100 inhabitants pr. km^2. As of 1/1 2004, in Viborg County and Ringkoebing County, 70% and 55% of the population were living in such municipalities, respectively (own calculations based on data from Statistics Denmark).

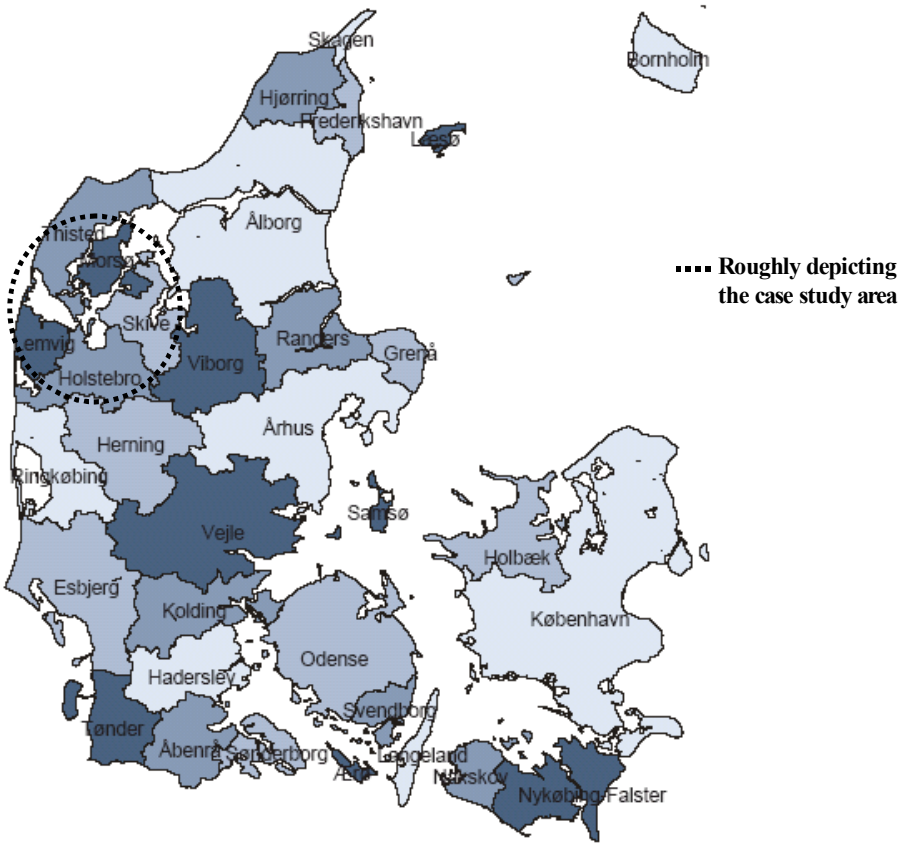
[21] Tanvig (1995).

locally cannot just be compensated for by commuting to another job elsewhere. Furthermore, there is no doubt a mismatch between the qualifications gained in the industrial labour market (many of the people working here are unskilled and semi-skilled workers) and the needs for the knowledge based economy for qualifications with its employees. The following will give a kaleidoscopic outline of the socio-economic situation of the chosen region.

Statistical indicators

A lot of data sets are only on county level, while some are on commuting regions. With regards to the commuting regions it is mainly Lemvig, Holstebro, Skive, Morsoe and Thisted that are relevant for the interview area. See Map 4 below.

Map 4. Commuting regions, 2000



Note: The commuting regions are defined so that at least 80% of the inhabitants have their workplace in the region. The different colours are only used to differentiate between the regions.

Source: Miljøministeriet (2003).

Population

The two counties cover an area of about 9,000 km^2, which gives a population density of around 57 inhabitants pr. km2. The density is thereby under half of the national average of 125 inhabitants pr. km^2, cf. Table 4.

Table 4. Population density, 2004

	Number of inhabitants, 1/1 2004	Area, 1/1 2004, km^2	Population density, 1/1 2004
Ringkoebing county	274,830	4,854.0	56.6
Viborg county	234,659	4,122.5	56.9
Denmark	5.397,640	43,098.3	125.2

Source: Danmarks Statistik (received data file) (2004).

The population in the two counties make up 9.4% of the total population in Denmark. The total number of inhabitants in Denmark has been more or less constant for a number of years, but in some commuting regions of the study region there has been a decline in population of up to 5.5% in the period 1982-2002[22]. By comparison, some growth areas in Denmark have seen a growth of up to 13.8%. The National Planning Report of 2003 documents a direct association between distance to cities and the development of the number of inhabitants in rural municipalities. Those that lie furthest from the biggest towns and cities have witnessed a marked decline, while those that lie close have not had decline, but growth[23].

Demographically, the share of young people is lower than in the rest of the country. This is primarily caused by young people moving out of the area in connection with their enrolling in an institution of further and higher education in larger cities. On the other hand, the share of older people is relatively big, especially in some of the municipalities in our study area[24]. A population projection states that the share of older will increase in the coming years[25].

There is a big difference in migration patterns across Denmark, which means that the commuting regions in our study have a net out-migration (up to –7.3%) in the period 1982-2001, while there is a net in-migration to the large cities[26].

Industry and trade and labour market

In terms of occupation, industrial activity carry more weight in the two counties than in Denmark as a whole. The difference is outweighed by a relatively smaller occupation within service trade. Agriculture is not very dominant, although occupationally it is twice as big relatively compared to the rest of the country, cf. Table 5.

[22] Indenrigs- og sundhedsministeriet (2003: 31).

[23] Cf. Table 2 in previous section.

[24] Indenrigs- og sundhedsministeriet (2003: 32/33).

[25] Markeprand et al. (2003).

[26] Indenrigs- og sundhedsministeriet (2003:36)

Table 5. Employed persons by sector, 2003

	Ringkoebing County	Viborg County	Denmark
Primary trade	7.3%	7.5%	3.7%
- *herein agriculture, forestry*	*6.4%*	*6.9%*	*3.3%*
Manufacturing	26.7%	25.0%	16.1%
Construction etc.	6.4%	7.1%	6.7%
Service trade	30.2%	28.3%	38.2%
Public and private services	29.5%	32.1%	35.4%
I alt	100.0%	100.0%	100.0%

Source: Danmarks Statistik (2004), www.statistikbanken.dk

The occupational conditions in the study area hold characteristics that are relevant to ISP's case choice and purpose. Especially in the western parts of the study area, the occupational development has been worse than in other areas in recent years[27]. As for the population development, a direct association has been showed between location of workplaces in relation to the largest cities and the development in the number of workplaces. The further away, the more has the stock of workplaces been reduced within recent years[28].

The former positive development mainly within manufacturing has resulted in quite low unemployment figures in peripheral areas during a number of years, as is seen in other countries as well. As a matter of fact, the unemployment rate in the study area was under 5% in 2002, whereas some other parts of the country had rates of 5-7% or more[29]. Since then, especially within recent months, a number of large companies have closed down in the peripheral areas and especially the loss of workplaces for unskilled workers is noticeable.

The primary trades and food processing sector have "always" had a relatively big importance, but the employment in this field has in recent years been reduced considerably in the study area and even more so than in the rest of the country. There has been a decline of 4% in 1994-2002 in the workplaces related to fishing and agriculture in the concerning commuting areas, whereas the figures are from 0 to –2% in the biggest part of the rest of the country[30].

The number of VAT registered companies in the two counties was 17,600 (Ringkoebing county) and 15,546 (Viborg county) in 2001. Of these, 1,453/1,182 were manufacturing companies. In Ringkoebing county, there are especially many within the textile and leather industry and manufacturing and processing of iron and metal. In Viborg county, there are also many within manufacturing and processing of metal, but the number of companies within the furniture industry is also high, 159/175. The number of companies within food, drinking and tobacco industry was 134/130[31]. For statistic-technical reasons, it is not possible to determine the number of companies within tourism.

[27] Especially the commuting regions Lemvig, Thisted, og Morsoe have had a weak occupational development. Økonomi- og erhvervsministeriet (2003:30).

[28] Miljøministeriet (2003:31).

[29] Økonomi- og erhvervsministeriet (2003:40).

[30] Ibid. (2003:31).

[31] Danmarks Statistik (2004), www.statistikbanken.dk

By far the most Danish manufacturing companies are small in an international context. Most of them have less than 20 employees and only very few have over 500 employees. In the study area, the same applies.

The entrepreneur rate says something about the magnitude of new business activity in the areas (number of entrepreneurs pr. 1000 inhabitants aged 16-66) and thereby it reflects the degree of maturity of the stock of companies as a whole. Our study area had the lowest rate in the whole country, 2-3 % during 1994-1998, while the eastern part of Jutland, for example, had 4-5% and most of Zealand more than 5%[32].

Competences and innovation

The area is lacking behind in terms of educational level. In 2003, for example, 2.2% (Ringkoebing County) and 2.7% (Viborg County) had a long-term further education. In Denmark as a whole, the figure was 4.9%. Instead, many more have an educational background that to a higher degree matches the agricultural and industrial society. Especially many have no education above fundamental level and many have a professional secondary education, cf. Table 6.

Table 6. Educational level, 2003

Highest completed education (16-69 years):	Ring-koebing county	Viborg county	Denmark
Only primary school (%)	40.4	41.1	35.2
General secondary education (%)	6.4	5.9	8.8
Professional secondary education (%)	37.1	37.0	34.8
Short-term further education	3.6	3.3	3.9
Medium-term further education (%)	9.8	9.7	11.1
Bachelor (%)	0.5	0.4	1.1
Long-term further education (%)	2.2	2.7	4.9
Total (%)	100	100	100

Source: Danmarks Statistik (2004), www.statistikbanken.dk

Viborg and Ringkoebing Counties have a wide spectre of educational institutions on basic educational levels, e.g. primary and secondary education (high schools, technical schools) and short-term further and higher educations. The latter are concentrated around business and trade, the educational sector and the social and health sector.

However, there is a shortage of medium-term and especially long-tern educations in both counties. Herning Institute of Business Administration and Technology in Ringkoebing is the most advanced educational institution in the business-related field. This institute offers only one education at MA level, whereas the rest are at BA level or less[33]. Neither county have a university.

[32] The lowest rates are found in the commuting regions Lemvig, Morsoe and Holstebro. Økonomi- og erhvervsministeriet (2003:53).

[33] Herning Institute of Business Administration and Technology (2004), www.hih.dk

An indication of the degree of innovation seen as knowledge-based activity in the two counties can be made by comparing figures for employment growth within the new economy form 1993-1998. This growth was 5% in Ringkoebing County and 4.5% in Viborg County, while the national average was 11.6%[34].

2.1.4 The agrifood industry in Denmark

Historically, the agricultural industry and the food industry have been of big importance in Denmark. However, during the last decades, the number of farmers has decreased radically due to rationalisation of operations. During the same period, the processing industry has increased in terms of economy and employment.

Up until the beginning of 1960s the total number of farms in Denmark was quite stable at around 200.000 units. After this time, development in technology and size economy resulted in 2500-3000 farms being abandoned each year. During the last 20 years, the exodus from farming has been more than 3% per year (and increasing). The remaining farms specialize and buy up more and more land.

In 1970 there were 140,200 farms with an average size of 21 hectares. These figures had changed in 2002 to 48,800 farms with an average size of 55 hectares[35]. There has been an even more significant decline in number of livestock than in number of farms. This is due partly to the fact that the tendency of specialization has caused that mixed stocks with all three types of domestic animals quickly disappeared in favour of stocks with only one type of domestic animals per farm, and partly to the fact that a number of farms became pure plant growing farms[36].

The food processing industry is an important industrial sector in Denmark and contributes by 16.9% of the total gross value increase in the Danish manufacturing industry, equivalent to 29.6 million DKK. Exports are 22.3% of the total Danish exports, equivalent to app. 90 billion DKK per year. In general, the food sector has app. 170,000 jobs or app. 7.7% of the total employment rate in Denmark. This sector has the highest proportion of unskilled workers: 46.6% and industry in general has 33%, even though the share of unskilled workers has been declining for a long time[37].

In 2002, there were 2092 workplaces in food, drink and tobacco industry in the whole country, of this 36% were micro workplaces (with 1-9 employees) and 48% small workplaces (10-49 employees), while only 15% were medium-sized (7% have between 50-99 employees) or big (over 50 employees)[38]. Market wise, however, the picture is somewhat different, as the three biggest companies in each of the part-sectors in the food industry on average hold 37% of the total turnover in 2001 and this share is increasing. So here the food industry differs significantly from the total Danish industry that to a much smaller extent is characterized by concentration of companies. In the manufacturing industry as a whole, 11% of the turnover

[34] Nordstrand et al. (2001:67-69).

[35] Landbrugsraadet (2003:3).

[36] Hansen (2001:50).

[37] Ibid. (p. 27-28).

[38] Danmarks Statistik (2004), www.statistikbanken.dk

was divided among the biggest companies in the sectors[39]. By means of mergers and takeovers, the companies in the food industry have established synergy effects and economics of scale, which has given the sector much competitive power. In the branches of meat, dairy, sugar and ingredient industry the leading Danish companies are among the biggest in Europe.

By comparing with other countries, you find that the Danish agri-food sector plays an important economic role measured at national level, se table below.

Table 7. Economic importance of agri-food sector

	DK	EU-15	OECD
Agricultural exports in % (a)	20.0	8.5	7.6
Agricultural population (b)	4.1	4.7	8.3
Agricultural population (c)	4.1	4.7	8.7
Food industry (d)	28,2	12.0	10.8
Net exports/farmer (e)	280,000	-6,100	-2,000
Share of increase in value (f)	4.0	2.0	2.0
Food exports in % (g)	23.3	8.7	7.7

a) Agricultural products in total in % of all trade
b) Agricultural population in total (1998)
c) Economically active population (1998)
d) Turnover in food industry in % of all
e) Net = Total agricultural exports minus total agricultural imports. Per economically active in agriculture. DKK (1998)
f) Increase in value in agriculture in % of all (1997)
g) 1997
Source: Hansen (2001:18).

In the beginning of 2003, the Danish Ministry of Food, Agriculture and Fisheries had an analysis made in order to assess the growth potentials through innovation for the food sector in Denmark[40]. Here, it is summarized that:

- Structural adjustments and specializations within the Danish food sector result in increased market concentration in all links in the value chain of the food sector
- The Danish food sector is characterized by its strong export orientation
- The sector is not specifically exposed to fluctuations of the market which makes it a big stable and central factor to Danish economy
- It is a big challenge to maintain the fine position of the Danish food sector in foreign markets
- Competitiveness in price and quality is an absolute prerequisite
- The sector faces new consumer demands and wishes, more and more related to production (in preference to the product, which it has been till now). The issues are now sustainability, environment, animal welfare and health

The analysis concludes that a continued competitiveness in the global market depends on a high degree of formalized innovation, and that this is not the case today:

[39] Ministeriet for Fødevarer, Landbrug og Fiskeri (2003).

[40] Ibid.

> "[…] the innovation efforts in the food industry are typically small when measured on traditional indicators. The number of employees occupied with product development is typically low and only in the big companies we find proper development departments. The funds allocated to development are small, typically less than 500,000 DKK per year."[41]

The big companies lie in the so-called innovative elite whereas the middle group consists of tradition-bound companies that have only to a small extent formalized the innovation efforts. At the bottom lie the vulnerable companies without any innovation efforts at all, which consequently leads to bad performance. Therefore, bigger efforts should be made to make the big ones share their experiences with the small ones[42]. The analysis also points out the need for easier access to risk capital and a targeted and prioritized use of public research programmes for this purpose.

Characteristics of the selected agri-food sub-sectors

We have chosen to take a closer look at the brewery and beverages sector as well as the dairy sector at the supply chain.

In the Danish *brewery and beverages sector*, the number of breweries peaked a century ago. In 1904/05, more than 400 companies were registered (of which, 384 were breweries producing a Danish type of household beer, low fermented and of medium gravity: "hvidtøl"). Since then, competition among breweries has been tough and the "hvidtøl" breweries gradually disappeared completely. Today, eight Bavarian beer breweries are left in Denmark. The three biggest ones have eight production facilities in total, and they produce 80-90% of the total beer sales in Denmark. Thus, beer is produced in 13 places in Denmark. During the last few years, however, a number of micro breweries have appeared here and there in the country. Their production is very small, and it is normally directed at only direct sale in their own shops or restaurants.

Carlsberg has for a very long time now been the absolutely dominant company in the Danish beer market, both in retail trade, in the restaurant sector and in all types of beers.

Table 8. Market shares in the Danish beer market 1985-2002, %

	1985	1995	2002
Carlsberg (a)	70	71	71 (c)
Bryggerigruppen (b)	5	6	15-16
Other breweries	25	22	10-11
Import	0	1	2

a) Carlsberg has stated that their market share has declined in 2003.

b) Bryggerigruppen was originally called Jyske Bryggerier, which merged with Faxe in 1989. The company changed its name into Bryggerigruppen in 1992 and merged with Albani in 2000.

c) Carlsberg has stated that their market share was 67% in 2003

Source: Konkurrencestyrelsen (2004:154)

[41] Ibid. (p. 14). The amount equals approximately 75,000 Euro.

[42] Ibid. (p. 15).

As can be seen from Table 8, imported beer holds a very small share of the Danish market. This is partly due to the Danish deposit and duty system, which has made access to the Danish market difficult for foreign breweries. But cross-border shopping, where the Danes go to Germany in their own cars and buy beer to take home with them, is heavily increasing. The Danish Institute of Border Region Studies estimates that one out of three beers drunk in Denmark is bought in Germany[43].

The first co-operative *dairies* in Denmark were established in 1882. App. 50 years later, there were app. 1400 co-operative dairies plus more than 200 private dairies. Today there are 42 dairies left, but the branch is totally dominated by one company namely Arla Foods. Arla Foods is still a co-operative dairy, but with more than 4100 million kilos of milk weighed in per year we cannot easily compare it with the number of small dairies, weighing in between 10 and 50 million kilos a year. The second biggest dairy in Denmark weighs in 48 million kilo per year – 85 times less than Arla Foods[44]. So there are still private dairies, but 97% of the milk is delivered to the co-operative dairies (and here especially to the dairies owned by Arla).

Organisation and important actors

Historically, Denmark has had many local and regional agricultural organisations. During the last century, more or less all of the organisations were merged so that there is only one important left today, namely Dansk Landbrug (Danish Agriculture). In this organisation, app. 90% of all Danish farmers is organized. The head office of Danish Agriculture is in Copenhagen, but the organization has regional and local organizations scattered in the whole country. Danish Agriculture has also set up an advisory system, were the national focus is Danish Agricultural Advisory Service, National Centre in Århus, which comprises approximately 60 independent local advisory centres.

Both the brewery and beverages sector and the dairy sector have their own branch organisations. Usually, the major companies are members. But as will be shown later, there are other actors relevant to development activities within the sector.

2.1.5 Few facts on the agrifood industry in the Limfjord-region

The Limfjord region is generally strong in the primary sector with many and very different farms, but still farms where the live stock, including milk production, play a big role. In the region, the manufacturing industry primarily deals with processing of meat, fish, and milk[45]. There are processing plants in the whole region, but the biggest food processing plants are generally placed in the southern parts of the two counties.

During the latest years, the food industry of the region has been influenced by big centralizations like in the rest of the country. In the study area there are still six major slaughterhouses (with more than 100 employees), of which however only one is not a part of Danish Crown. The slaughterhouses are scattered in the whole study area, but there has been a concentration of the activities of Danish Crown in Holstebro. Holstebro is also the domicile

[43] Bygvrå (2003).

[44] Mejeriforeningen (June, 2004). http://www.mejeri.dk/

[45] Oxford Research A/S (2003b).

for one of the big dairy complexes of Arla Foods with almost 600 employees, just like the bread-producing group of companies of Cerealia has a company in this town. However, another town in the area, Thisted, has a number of (small) private food companies: a slaughterhouse, an ice cream factory, a margarine factory, a brewery and a malt house.

Unlike both the dairies and the slaughterhouses the brewery sector has little connection to the local area when it comes to raw material. It is historical reasons that have decided the location of the breweries and the malt house. This has led to a number of logistic challenges, especially for the malt house, as almost the total production leaves the region and the country – here the export harbour in Århus is very central, as it is situated 148 kilometres away by the main road. The same picture applies for the bigger food company groups, which may be the reason for their location in Holstebro in the southern part of an otherwise strong raw material producing area. In general, the smaller private companies have more local/regional sale.

2.1.6 Tourism in Denmark

- Danish Tourism has a turnover of approximately 45 billion DKK yearly and creates a total surplus of 27 billion DKK. This represented 4.2 % of the national GDP in 1999[46].
- The tourism industry employs approximately 70,000 on a full-time basis. The number is much higher during the high season. Employment in tourism represents 2.8% of the total employment. Especially in sparsely populated areas, tourism has an essential importance for the employment, even though the earnings not necessarily are going into the local area.

Measuring the impact of tourism is a question of defining the sector. Since 1996, the Danish Tourist Board has operated with the so-called TØBBE measurement[47], divided in tourist nights and expenditure on national and regional level. These calculations will be used henceforward, if nothing else is stated.

- After a boom in the early 1990s, the number of tourist nights in Denmark reached 44.2 million in 1995[48]. Since then the number has decreased to 41.4 million nights in 2001. Although there has been an increase in the number of nights to 42.4 million in 2002, the number is still under the level in the mid-1990s.

In 2002, the Danish Government published a political action plan on tourism and in continuation of this; an analysis in co-operation with the industry was to be completed. This resulted in a publication by the Ministry of Economics and Business Affairs (2004), a structural analysis of the tourism industry based on three individual reports[49]. It summarises the characteristics and challenges for Danish tourism:

[46] Danmarks Turistråd (2002)

[47] Ibid. The TØBBE data contains two sets of database: 1) daily consumption 2) number of nights. Tourism expenditure by region is calculated as the product of the estimated average daily consumptions of tourists and the number of nights tourists spent in the regions of Denmark.

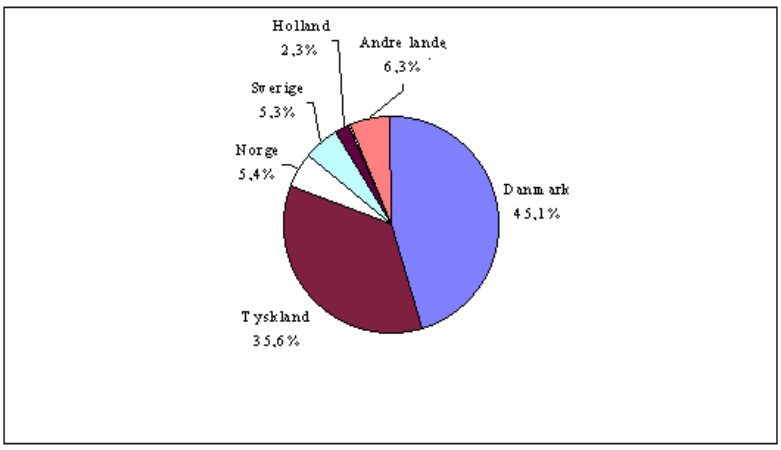
[48] Number of nights: 28 million in 1989, app. 44 million in 1995/1997.

Økonomi og Erhvervsministeriet (2004).

[49] Ibid.

- Compared to other North European countries, the amount of foreign nights in Denmark is quite high. The Danish tourism product, that consists of two kinds, coastal tourism and Copenhagen, is therefore relatively high in demand and competitive, especially the coastal product. However, the industry is exposed to an increasing international competition, which affects the earnings. The relatively high wages in the industry and in general high cost levels make the industry less attractive for international investments. Therefore it is important for the industry to focus on the strengths, which are to maintain the traditions and emphasize the uniqueness of the Danish product in the development and marketing of tourism[50].
- Denmark belongs to the countries/regions in Northern Europe with most foreign nights. The foreign visitors represented in 1999; 24 million nights out of a total of 42 million nights. In comparison, foreign visitors represented only 21 million nights yearly in Norway, Sweden and Finland together. Most of the foreign tourists are Germans, but Norway and Sweden also contribute with many tourists.
- In general, the Danish product has a low level of complexity, which makes it difficult to increase its value. The strong dependency of few markets (especially Germany) increases the vulnerability. There is though an increased focus on new target groups within the neighbouring market and groups with more spending power (e.g. other Scandinavian countries). The product is also very seasonal compared to countries that have an interesting tourism product in the winter season (e.g. Austria, Switzerland and the neighbouring countries Norway and Sweden). This leads to problems with exploiting the capacity and seasonal unemployment.

Figure 1. The distribution of tourists



Source: Danmarks Statistik, Danhostel, Danmark Turistråd.
Danmarks Turistråd (2004), www.danskturisme.dk

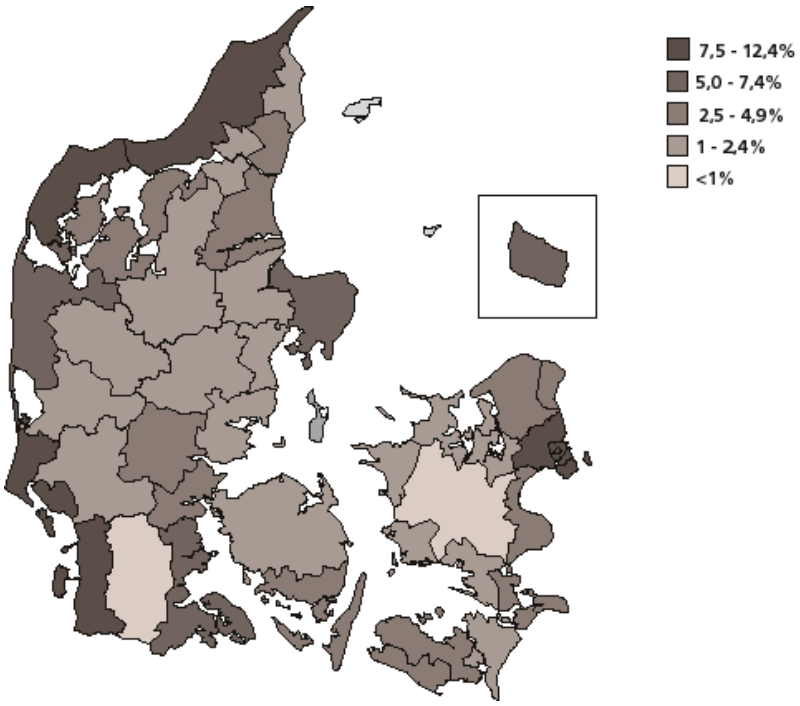
[50]A product that emphasizes closeness, including time spent together, safety, personality, individuality and intimacy.

The decrease in the number of nights is especially caused by a decline in the number of nights from the main market, Germany[51]. This has been labelled "The German Challenge". An investigation shows that there is a need for further development of products, processes and organisations to be able to keep up the positive image Denmark holds in Germany as a holiday destination[52]. On the other hand, the growth in domestic tourism has to a certain degree been able to compensate for the overall decline.

Regional development and tourism

Coastal tourism and other kinds of tourism affect the regions differently. According to Zhang (2001), tourism plays a different role in the different regions[53]. There is also a large variation when it comes to tourism revenue received by the Danish regions. There is a tendency that tourism plays a more significant role in the more peripheral regions than in the metropolitan regions.

Map 5. Distribution of tourists in Denmark



Source : Holten-Andersen et al. (1998)

[51] Zhang (2001).

[52] Den Tyske Udfordring

[53] Zhang (2001).

The industry is in general characterised by low-wage-jobs, seasonal occupation and having many people employed part time[54]. Since relatively few jobs demand a high-qualified work force, the competence level is also low. For that reason, tourism is not always regarded as attractive to the local and regional labour market. Also many operators are not living in the tourism areas, and being taxed where you live means that tourism areas, in particular at the North Sea Coast with mass tourism, do not gain all revenue and taxes created in the areas.

The nature of firms and innovation in Danish Tourism

A characteristic of the Danish tourism industry is the relatively low level of innovation compared to service industries in general. One explanatory factor might be the presence of many small/micro enterprises performing at a low level of expertise[55]. Studies show that the tourism industry is characterized by having a relatively low level of professional management instruments, among these lesser-developed cooperative patterns and a systematic organisation than service industries in general[56]. A seasonal variation also makes it difficult for the tourism industry to attract qualified employees and decreases the level of competence.

New evidence found in a report published recently by the Ministry of Economics and Business Affairs (2004) indicates that over 50% of tourism operators within a period of two years actually have been innovative. The survey calls attention to the increasing competition within the industry the last years as an explanation of the increasing level of innovative tourism firms. This activity is especially found in the holiday centres, camping/caravan sites and amusements parks. What characterises innovation among the SMEs in Danish tourism is its level of closeness to the market. The innovation is based on the tourists' demand for new holiday experiences.

Main actors and support agents

External actors to the operators play an important role in tourism development in Denmark. Theses actors are a heterogeneous group consisting of public authorities, tourism trade organisations, research and development institutions and others.

National level

At national level, the *Danish Tourist Board* functions as an umbrella organisation, with the main responsibility of developing and marketing Danish tourism. The industry is organised around the following areas: Coastal tourism, Active holidays, City tourism and Business tourism.

Other actors of importance at the national level are different tourism sector organisations and public authorities, e.g. *The Danish Forest and Nature Agency* and *The Danish Outdoor Council.*

[54] Lundtorp (1997).

[55] Similar to worldwide tendencies, it is estimated that 80% of Danish tourism firms can be characterised as micro firms and small and medium sized firms. Erhvervsministeriet (2000).

[56] Jensen et al. (2001)

Regional and local level

In 1996, eight regional tourism development organisations were established[57]. The primary goals for these organizations are to coordinate and carry out/implement promotion activities and develop/maintain the market for regional tourism, geographically and seasonally. The organisations are also involved in product development.

In 2004, a new construction was made when the four of these regional organisations in Jutland joined forces[58]. The aim was to promote Jutland as one tourism destination, especially aimed at the Danish, German, Norwegian and Swedish market. The expected result of this is that the promotion is to become more clear-cut. There will be a reduction in the marketing tools, but on the other hand they are expected to become more effective and have more impact.

In the counties of Ringkoebing and Viborg, there are three levels when looking at tourism organisations. At the regional level, there are the two regional tourism development organisations covering the study area, *Turistgruppen Vestjylland* og *MidtNord Turisme*. At the local level, there are local tourism associations and tourism bureaus. At the level in between, some municipalities cooperate by running a tourism destination organisation, e.g. *Destination Thy, Destination Skive* and *The 7 in the North West.* Public authorities, both at regional level (county councils) and at local level (municipalities), obviously play an important role in the development of the industry as well.

The operators/the attractions are also important actors. To a certain degree they are organised as co-operations. An example is *"Jutland's Attractions"* which is a marketing co-operation between 14 of the major tourist attractions in Jutland. Within a smaller area, 16 attractions constitute *Western Jutland's Attractions*.

2.1.7 Tourism in Ringkoebing and Viborg County, the western Limfjord area

The Danish West Coast constitutes a product that has lead to a form of mass tourism. The forms and level of tourism activity vary considerably in the two counties. While Ringkoebing County is one of the major coastal tourism areas, Viborg County is lagging behind. Viborg County is located between two strong counties for coastal oriented tourism, as mentioned Ringkoebing County and to the north the county of Northern Jutland. Although Ringkoebing is well visited in parts of the region, there are areas less visited, mainly inland areas, but also the northwestern part, which includes areas of the study region.

- In 2003, the number of tourist nights in Ringkoebing County reached a total number of 4.7 million. In a five-year period (1998-2003), there has been a 6% increase in nights.
- In 2003, Viborg County reached a total number of 1.8 million nights. In the same period 1998-2003, Viborg experienced a decrease of 9%.
- On country level, Denmark reached a total number if 43 billion nights in 2003. From 1998-2003, there has been a 0.7% increase.

[57] The Tourist Group West Jutland (TGV) was established in 1991.

[58] Tourist group West Jutland, Mid-North Tourism, Region South East & Southern Jutland, and East Jutland Tourist Development Foundation.

The dominant type of tourism in the study area is mainly family-oriented tourism based on accommodation in "summerhouses" located in areas facing the North Sea and Limfjorden. Ringkoebing County holds most summerhouse areas along the coastline of the two counties (mainly Holmsland Municipality, with Soendervig as the main destination). In Viborg County, a pilot investigation is about to be carried out for a National Park and Conservation Area. If carried out, the national park is expected to have positive effects on tourism in the area.

The major attraction in the study area is nature, especially associated with the closeness of water.

2.1.8 Manufacturing: The furniture industry in Denmark

The furniture sector in Denmark currently comprises approximately 400 companies, which all together in 2003 produced furniture to the value of DKK 18.9 billion with a direct employment of approximately 19,500 people. More than 84% of the production is exported, making the furniture industry Denmark's sixth largest export industry. The sector employs approximately 10% of the labour force related to manufacturing. It is very export oriented and has experienced a decade of growth and expansion during the 1990s, but is at present facing stagnation in growth.

Danish furniture manufacture is divided into three main segments:[59]

- Furniture for the home, e.g. furniture for children' and teenagers' rooms, bedrooms, dining rooms, home offices, etc. Furniture for self-assembly ("knock-down") and panel furniture are other areas of competency together with solid-wood products in beech, ash, teak and pine.
- Commercial and contract furniture in demand from professional architects, developers and operators all over the world for furnishing workplaces, institutions and public spaces.
- Designer furniture has been at the forefront of the international furniture scene since the 1950s with design classics by famous names in architecture and today a new generation of innovative furniture designers are active internationally.

In addition, the Danish furniture industry incorporates a sizeable production of kitchen elements, and subcontract manufacture of furniture components is a significant facet of the industry.

Major challenges include:

- Icreased competition from furniture producers abroad, especially in Eastern Europe
- Relatively low research and innovation rates and few new products ready for marketing
- Limited use of the competencies of the workforce and relatively weak level of education of management
- Change in demand patterns, with growth in cheap furniture and expensive quality furniture, while the middle-group of furniture producers lose markets[60]

[59] Foreningen Dansk Møbelindustri (2004), www.danishfurniture.dk

Furniture is described as a mature industry that has been relatively slow to restructure itself compared to e.g. the Danish textiles industry that today survives in Denmark as a trade business based on product innovation, product and logistics management[61]. For furniture, the re-localisation of production to Eastern Europe, the Baltic countries, South East Asia and China looks at present more and more attractive.

The markets for different types of furniture products have been developing in diverse ways in the last 5 years. Often the same company is producing different product types. In the last 5 years exports have grown to markets in Sweden and Norway, while the largest markets in Germany and UK have been more or less stable.

National actors and support agents

The Danish furniture industry is involved in the general business and technological service system in the country, where there are special departments for wood and furniture as well as process technologies. The main actor on this in Denmark is the Danish Technological Institute, Taastrup. The Institute has 6 premises throughout Denmark. It is an independent, not-profit institution. The Institute works with different fields: Building, Technology, Industry and Energy, Informatics, Materials, Productivity and Logistics, Industrial Development. Furniture relevant activities are placed in several of these units. Business services and technological information centres, e.g. TIC Viborg, who offers advice and consultancy, are often working closely together with the technological institute The TICs (now Business Centres) are independent regional institutions with public support.

In the education and research area, the technical schools and business academies are important for the formal training of the work force, primarily Skive Technical School with a long tradition and national position as the institution for formal training of cabinetmakers and wood process technologists. Århus University and Royal Agricultural and Veterinarian University (Copenhagen) on tree materials, hardwoods etc., Aalborg University on production technology and process control etc. and the Architectural Schools (Århus and Copenhagen) and the Danish Design Centre (Copenhagen) all represent the highest level of formal knowledge of relevance to furniture production.

Employer organisations and guilds are also active players in the development of the industry, e.g. Danish Furniture Manufacturers Association, Træets Arbejdsgivere/DI, The Danish Furniture Makers' Quality Control, Skive Cabinet Makers Guild. The Development Centre for Furniture and Wood, Skive, established 2002, as a "Regional Growth Environment" with funding from Viborg County and the Ministry of Science, Technology and Development, is a new actor in this respect. The operation of the centre is organised as collaboration between Business Academy Mid-West, Danish Technological Institute, Technological Information Centre Viborg/Viborg County.

Finally, development councils, municipal business offices etc. must also be mentioned among the development actors, in the selected region, especially Salling Udviklingsråd who offers business counselling, experience-groups, business angels etc. for entrepreneurship across

[60] Development Centre for Furniture and Wood (2004), www.moebelcenter.dk

[61] Oxford Research (2002).

several municipalities in the area. This sub-regional organisation is co-funded by membership fees from adjoined local companies and Viborg County.

2.1.9 Few facts on furniture manufacturing in Viborg and Ringkoebing counties

We find a furniture cluster in the Salling-Mors area of Viborg County and a kitchen manufacturing and wood industry cluster around the city of Herning in the middle of Ringkoebing County with relatively high employment specialization compared to the national average for the furniture industry.

Table 9. Employment in the furniture industry, 2003

	Viborg County	Ringkoebing County	Denmark
Total	121,744	146,016	2,741,386
"Furniture and other industry" (a)	5,046	3,356	29,699
"Furniture and other industry" (% of total)	4.1	2.3	1.1

a) "Other industry" includes 9 different, small industries, e.g. manufacturing of coins and medals, music instruments, toys. For the whole country, the furniture industry made up 71,6% of the total employment in the joint category.

Source: Danmarks Statistik (2004), www.statistikbanken.dk

Table 10. Distribution of enterprises in the "Furniture industry and other industry" by number of employees, 2002

Employees, number	Ringkoebing County		Viborg County		Denmark	
	Enterprises	%	Enterprises	%	Enterprises	%
1	30	22%	24	17%	615	34%
2-4	21	15%	27	19%	445	25%
5-9	16	12%	12	8%	215	12%
10-19	28	20%	24	17%	207	11%
20-49	25	18%	21	15%	180	10%
50-99	8	6%	18	13%	78	4%
100+	10	7%	18	13%	61	3%
Total	138	100%	144	100%	1801	100%

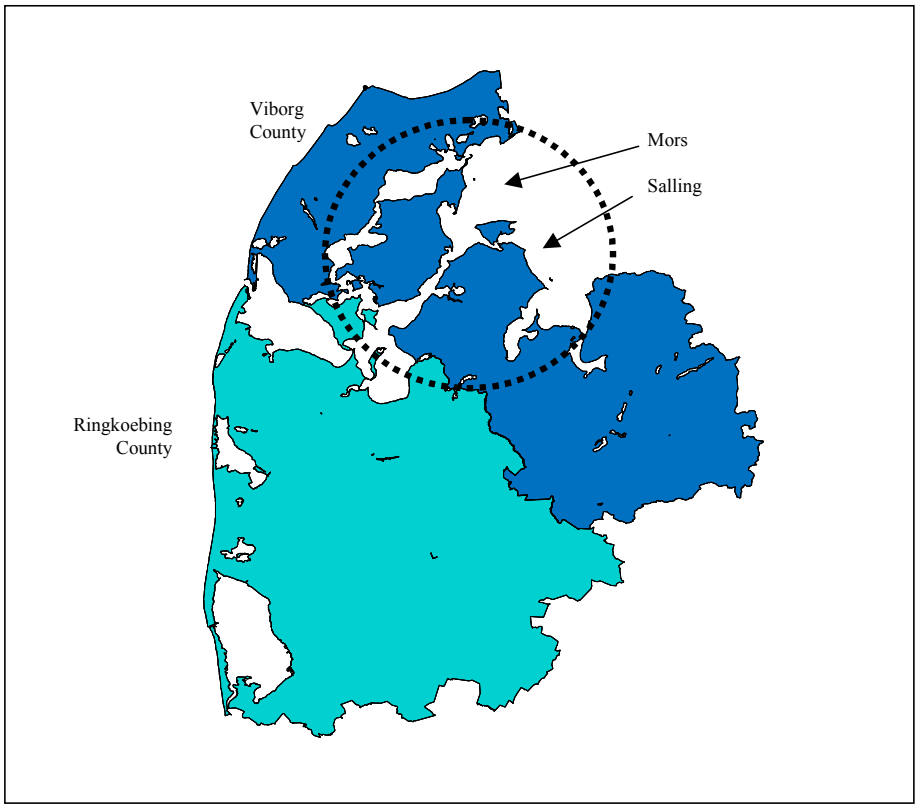
Source: Danmarks Statistik (2004), www.statistikbanken.dk

The size of the workplaces in the sector in terms of employment underlines the specialization in furniture in the 2 counties, where middle-sized and larger companies are much more present in the region than in the overall national size distribution.

2.1.10 Few facts on furniture manufacturing in the Salling-Mors region

In 2001, employment was estimated to 2,700 in the furniture industry of the Salling cluster in Viborg County. The area has experienced a growth by 50% in the period 1984-1993. There have been recorded 100 companies in furniture industry and related industries in the Salling region with Salling as the centre with 38 furniture companies. The annual turnover is approximately 4 billion DKK with 3 billion for exports. A low estimate of 15% of the annual turnover in Danish furniture industry was in 2001 coming from the Salling cluster[62].

Map 6. The furniture industry study area of Salling and Mors in Viborg County



The Salling area has a relatively higher share of medium and large workplaces within the sector measured by employment compared with workplaces in the industry in Denmark as a whole. The Skive Technical School with sector related education and the Regional Growth Environment (Development Centre for Furniture and Wood) are both located here.

[62] Oxford Research (2002).

2.2 Selected issues in policy and institutional initiatives

2.2.1 Innovation policy

Innovation policy can be formulated as a targeted effort directed towards the businesses community and the initiatives of firms and companies in this area. It can also be formulated as a policy that stimulates the surrounding factors, e.g. regional conditions. In Denmark, there are examples of both kinds. The government in office has formulated a number of initiatives and strategies with the aim of promoting growth in the country as a whole, called "Vækst med Vilje (Growth with Will). Among the priorities is innovation. But like in other initiatives, it is especially the framework conditions for innovation that are supported rather than the actual realisation, e.g. direct support to implementation of an innovation in a firm or company. There are a few exceptions, e.g. in connection with specially prioritised research themes and support schemes directed towards the food industry. Under all circumstances, there are hardly any regionally differentiated measures or priorities directed towards innovation, e.g. with special support for firms situated in peripheral areas.

Politically and administratively, innovation policy is mainly the responsibility of the Ministry of Science, Technology and Innovation. The ministry has a number of initiatives that especially aim at increasing research dealing with innovation. This, for example, expresses itself in incentives to strengthen the co-operation between universities and the business community. To this end, changes in the university legislation have been made, so that universities can be more open towards the business community and the promotion of business research (business PhDs, business innovators[63]). Moreover, in order to increase the scale of activity and results, initiatives have been taken to concentrate the sector research in bigger and fewer units. Present strategic research programmes with state support are focussing on high technological research such as information and communication technology, nanotechnology, energy technology, biotechnology and space research. Also research in food quality and safety is a prioritised area. New institutional frameworks have been established such as the creation of innovation environments and a number of growth environments, see later. Likewise, new funds for promoting research and development have been established, e.g. a high technologies fund.

2.2.2 Regional innovation policy

For many years, there has not been a targeted and selective effort towards promoting the development of particular geographical areas. Rather on the contrary, the Danish welfare system has been used as a tool for equalising regional discrepancies. Lately, there has been some departure from this. In 2004, the Ministry of Science, Technology and Innovation launched an initiative called "Knowledge moves out" with the purpose of strengthening research and innovation in regions with relatively low activities in this field. The initiative has a budget of 130 million DKK and four priorities: research, technology and innovation has to be put on the regional agenda; a strong regional co-operation regarding research and

[63] Concrete economic support is given to firms that hire persons that are to work specifically with innovation in the firm (business innovators) and that hire PhD-students (working 50% in firm and 50% in university during study, called business PhDs after graduation).

innovation; a regional competence lift; and more entrepreneurs in the whole of the country[64]. From the Ministry of Economics and Business Affairs, especially the National Agency for Enterprise and Construction, emanates a number of initiatives that more focus on the regional conditions for innovation or rather growth and development in general. In that the Danish Government wants all areas of the country to be attractive areas for development, these initiatives take in the distribution of financial grants from the EU (Regional Fund) and other measures to promote regional development. Among these is the creation of so-called Regional Growth Co-operations between ministries and parts of the country (in all 15 designated peripheral areas) that have the purpose of strengthening business development and settlement in the areas. Another measure is the establishment of regional business-political co-operations between the Ministry of Economics and Business Affairs and different regions regarding designing of strategies for development of the areas. Tourism policy and entrepreneur policy and a number of other business policies are also matter of importance for this field. A reconstruction of the state supported business counselling system has recently taken place, allegedly to secure quality and knowledge in the counselling. In this connection, a number of schemes and actors have been closed or put together, so now a so-called business service centre exists in each county.

It has to be added that the Government as a part of "Growth with Will" has drawn up an action plan for the tourism sector focussing on strategic alliances and realisation of new, innovative forefront projects.

As for innovation policy, there is no clear or direct regional policy stated at the state level, despite of the mentioned Regional Growth Co-operations. The attitude is still more and more, as in many other OECD countries, that regional policy should rather give incentives to regionally based activities than to subsidise directly. This has resulted in an ongoing debate about whether regional policy in Denmark and different business promotion schemes mostly benefit the strong and whether much more should be done for the development of peripheral areas than has been the case. Critiques point out the need for more resources and a conscious emphasis on a regional innovation policy combined with the promotion of entrepreneurship and development of competences.

[64] There are 8 measures in all: New principles for the co-operation between the ministry and the regions regarding research and innovation; strengthening of the regional engagement of knowledge institutions; improved regional information spread regarding the possibilities of knowledge co-operation; regional technology centres; strengthening of innovation consortia; regional knowledge projects; more business PhDs; strengthening of innovation environments. Ministeriet for Videnskab, Teknologi og Udvikling (2004), www.videnflytterud.dk

Table 11. The individual schemes and initiatives

Ministry of Science, Technology and Innovation	*Ministry of Economics and Business Affairs*	*Ministry of Food, Agriculture and Fisheries*
Research and education policy	Objective 2 under the Regional Fund, Interreg, among others	The Innovation Law
Strategic research programmes	Regional growth co-operations (in 15 designated peripheral areas)	Regional growth co-operation in areas dependent on fisheries
High Technologies Fund	Regional business-political co-operations	
Innovation environments	Business service centres (15 in all)	
Research parks	Promotion of entrepreneurs	
The recent initiative "Knowledge moves out"	Promotion of tourism	

The coming Structural Reform with its closing of the 14 existing counties, creation of bigger and thus fewer municipalities and its establishment of 5 regions can possibly pave the way for a new form of regional policy. Each region is to draw up regional development plans and establish a growth forum for each of the formulated strategies for growth and development, in which the development of peripheral and rural areas could be taken into consideration.

2.2.3 Rural development policy

Maybe parts of the things described above belong to rural development policy in other countries. The problem is that the dividing line is set in different places. In Denmark, the above-mentioned has not been perceived as rural policy. Generally, the question is what is meant by rural development policy in Denmark. It seems to consist of two kinds: the "official" policy where the responsible is the Ministry of the Interior and Health and what emanates from there. What is focussed on is typically village development, the survival of small communities, local democracy etc. The second kind is more focussed on agriculture and the development of the rural land, typically combined with EU support schemes. Here, we have mainly to do with the Ministry of Food, Agriculture and Fisheries at state level.

Thus, one clearly formulated rural development policy does not exist. The Ministry of the Interior and Health monitors the socioeconomic development of rural districts and it has the so-called Rural District Fund that offers support to small local development projects. In the ministry's view, formulating rural district policy is primarily the task of the municipalities and counties. From the Ministry of Food, Agriculture and Fisheries emanates a number of other instruments, among others a programme for entry into the EU's support programmes. In connection with the policy from here, there is a close co-operation with especially the

counties but also with other ad hoc organisations on the implementation of different schemes. The counties and other recipients of support funds (LEADER+) have also had to draw up a programme for their rural district development. Especially in the areas without a programme incorporating the EU programmes, there is considerable variation as to what is understood under the terms rural district and rural district policy.

One reason for the lack of clear rural district policies could be that the decentralised Danish Welfare State has managed a large number of tasks and functions, without which they would have appeared as "something special" in the most densely populated areas. In connection with the coming Structural Reform, it is possible that the rural district policy becomes clearer and that it will be seen in closer context with the term regional policy. Among other things, this will depend on what the coming regions put into the task.

2.2.4 Relevant support schemes

The Rural District Fund can support community development activities in all rural districts, with about 2.7 million EUR.

The Ministry of Food, Agriculture and Fisheries administers the LEADER+ programme, within the framework of the Rural District Programme. It is also from here that support to the fishing sector is informed (the FIUF programme). The LEADER+ programme includes activities that are equal to those of the Rural District Fund, but the LEADER+ programme is more directly oriented towards development of peripheral areas and holds instruments that promote citizen involvement. In each of the 12 designated areas, special action groups have been set up. In Denmark, the LEADER+ programme is not large in comparison to that of other countries. In economic size, it corresponds to that of the Rural District Fund.

The Rural District Programme, on the other hand, is much more comprehensive with many different sub schemes aiming at promoting the environment and nature interests, the development of agriculture and derived businesses. Article 33 in the programme is considered to lie closest to the other political schemes for rural districts. Its size corresponds to those of the Rural District Fund and the LEADER+ programme. Among other things, it can be used to support the marketing of new local quality products. Article 33 is administered in close co-operation with the counties. But under the Rural District Programme lies also for example the Structure Project Scheme that supports small and medium-sized enterprises in the food sector in connection with the reorganisation of production processes.

Table 12. The individual relevant schemes

Ministry of the Interior and Health	*Ministry of Food, Agriculture and Fisheries*
Rural District Fund	Rural District Programme, incl. Article 33 and the Structure Project Scheme LEADER+ (administered in 12 designated areas) FIUF (fisheries support)

”Growth with Will” also holds other initiatives within the food sector. Here the aim is to focus more on innovation than has been the case. The big food producing companies do a lot already, but more growth has to be created by making the many small and medium-sized enterprises in the sector more innovative. A part of this is the creation of the Innovation Law that gives support to innovation in food sector SMEs.

2.2.5 Rural development policy in the future

EU’s coming Rural Development Policy will mean that the Danish rural district policy will have to be unified more. It is expected that the emphasis will be put on the connection between considerations for nature and environment on the one side and growth and development on the other side. With regard to the question of bigger regional responsibility and contribution to politics within regional innovation policy, the EU has spoken favourably of incorporating the LEADER+ method with e.g. partnerships and contract deals in the overall rural district policy in order to obtain higher dynamics and regional ownership. Then the question is what is going to happen with the purely national scheme and the organisation of those rural district activities that emanates from them.

2.2.6 Linkages between innovation policy and development policy

From the above-mentioned it is evident that there are no clear linkages between innovation policy and development policy, but a number of indirect overlaps. A number of measures are taken, e.g. via the state policy within each area, but also via the coming Structural Reform and EU’s policies that point in the direction of more connection between the two. For example, more focus will be put on innovation and the building of innovation systems in areas where there might be a lack, yet potential.

2.2.7 The official framework for business services and innovation facilitation in the region

For many years, municipalities and counties have voluntarily involved themselves in business promotion, all dependent on political prioritisation. Ringkoebing County and Viborg County have chosen to invest a little bit more than what the counties have done on average both regarding business promotion and tourism[65].

In the following, the region’s framework for business services and innovation will be examined by looking at:

- Policies at county level regarding business promotion and innovation
- The general business service system: Business Service Centres and local business offices
- Support schemes
- Growth environments and knowledge centres
- Other institutions related to innovation

[65] Amtsrådsforeningen (2004), www.arf.dk

2.2.8 Policies at the county level

The counties have had a tradition of acting relatively offensive in the form of preparing and investing in strategies for the promotion of regional business development, where the term innovation appears to varying degrees, again dependant on the existing policy in the area. Both counties have chosen to put efforts into regional business development. Lately, both counties have taken a number of new and more cross-going initiatives, which will be outlined in the following.

Ringkoebing County has together with the Ringkoebing Inlet Co-operation (cross co-operation between four municipalities), the Business Counsel of North West Jutland and the Business Counsel Herning – Ikast – Brande - Aaskov recently established a Regional Business Development Counsel. This has been done to unite the actors in the area. The counsel has adopted three main focus areas:

- Research and education: The objective is to become known for research and education that can be exploited in local enterprises. In connection with a local research entity in the region in relation to the MA degree in business economics at Copenhagen Business School and Herning Institute of Business Administration and Technology, 10-15 new PhD scholarships will be established. Another MA business degree will be established. The engineer area has to be strengthened and more business PhDs shall be employed in the SMEs of the area.
- Knowledge centres and growth environments: The objective is to specialise the region with unique competencies within textile and clothing, electronics, wind, wood and furniture, building elements, metal, food and tourism and a focus shall be put on energy. Research, development and education have to play together.
- Marketing the region: The region has to be marketed with its distinctive features.

Viborg County has described its business and employment policies in an overall programme, called EVA 4. In comparison to other counties, the impression is that greater resources are set aside for the work, e.g. in connection with attracting and administering resources from the EU and national initiatives as the Business Co-operation between Jutland and Funen[66]. In the programme, you find the following focus areas:

- Good business conditions: This is especially seen in a large engagement in different business promotion institutions.
- Development of knowledge and competences: The county has set up a Competence Counsel that carries out analysis and seminars for the promotion of the knowledge level in the region. Presently, it is developing a so-called competence cluster project which focuses on enterprises in the food industry, the iron and metal industry and the cluster that already exists, the wood and furniture industry. The focus area holds a number of other education initiatives.
- Increased employment possibilities: Here the focus is on possibilities for job creation, technical advice service, a broad labour market and initiatives for the green areas, e.g. nature care. Normally, employment policy is the responsibility of the Unemployment

[66] This co-operation consists of the 8 counties, 173 municipalities and the Ministry of Economics and Business Affairs.

Agency and the Regional Labour Market Counsels, but in Viborg County there has been a tradition for a co-operation.

- Regional development and innovation

As regards regional development and innovation, the county has been one of the main originators of a special food development project called Dynamo. Tourism is also focussed on, e.g. a number of initiatives have been carried out by Mid-North Tourism[67]. At the same time, other initiatives on tourism development in the Limfjord area via Network Limfjorden have been taken, e.g. together with Ringkoebing County, see later. Under the heading, you also find IT-Centre Viborg that manages a number of IT development projects for and together with enterprises. IKT-Smil has a special initiative directed towards manufacturing enterprises in the nine northern municipalities, where the county, the business service centre and the local business offices work together. A special initiative is made in relation to the Hanstholm harbour. A project on aquaculture in Limfjorden has been initiated. Participation in the work of the North See Commission, where the county is the secretariat, is a part of it all. International transport co-operation and other international co-operation activities also belong to this.

The two counties together have recently proposed an "Innoversitet" in Mid and Western Jutland – an institution of higher education where the core competence is innovation and close co-operation with regional enterprises. The proposal combines the best from the activities from the Centres for Higher Education, the traditional universities and the business promotion sector.

2.2.9 The business service system

The general business service in the region is offered via the business service centres and local business service offices.

In connection with the reorientation of the state support to business service, the two counties have set up each their so-called business service centre. Both service centres have the purpose of assisting entrepreneurs and enterprises with less than 50 employees with advice on starting and operating an enterprise, establishing networks, innovation and product development. The Business Service Centre in Ringkoebing County resides in the business park Novem Park and is financed by two thirds from the county and one third from the state. There are 6 employees. The goal is to transfer 5-10 innovative entrepreneurs to HIH Development, which is an innovation environment with venture capital, see later. The Business Service Centre in Viborg County is solely financed by the county and has in all 21 employees.

By far the most municipalities have individually or together chosen to set up a local business office, many also a tourist office or a mix. This is also the case in our study area, where you find several local business offices, tourist offices, but also cross-municipal initiatives. They usually work as service centres for either the local business community or for the tourists in the area in general and act upon requests in particular. They can also have specialities, e.g. offering advice to entrepreneurs.

[67] Mid-North Tourism is a non-profit, regional marketing and development society with the aim of promoting tourism in the area.

2.2.10 Different support schemes

In both Ringkoebing County and Viborg County, there is access to a number of support schemes that target regional development and innovation to varying degrees. This applies to:

- The Objective 2 programme
- Interreg
- Article 33 of the Rural District Programme
- LEADER+

The Objective 2 programme can support business innovation and competence development in designated areas. A number of schemes and initiatives are found within rural district development, e.g. Article 33, LEADER+.

Support schemes that are not regionally oriented have been mentioned earlier.

Our study area is well covered in terms of support schemes.

2.2.11 Growth environments

Three growth environments have been created in the study area:

- Knowledge Centre for Food Development (KCFD): KCFD has the purpose of supporting, promoting and marketing sustainable and healthy quality products. This is done primarily through education efforts. Behind it are a number of local and national institutions of education and interest organisations. The centre resides in Holstebro.
- Development Centre for Wood and Furniture: The long-term mission of the centre is to enhance the competence base in the furniture and wood industry by developing new lines of educations and securing education as catalyst for innovation in the industry. Behind it are: Institute of Technology, the business service centre in Viborg County, Business Counsel Mid-West, Skive Technical School and Viborg County. It resides in Skive
- Knowledge and Competence Centre for the Wind Energy Sector: The centre is to work as co-ordinating growth centre that is to bring the education and research institutions and the wind energy sector together with a view to spotting and examining relevant issues within the sector. Behind it are: Research Centre Risoe, University of Aalborg, Skjern Technical School and HIH Development. It resides in Holstebro.

2.2.12 Other institutions involved with innovation facilitation

Both counties run a number of institutions of education and are active in the creation of Centres for Higher Education that have special profiles in relation to the already existing institutions offering short-term and medium-term education in the areas.

In *Ringkoebing County*, you find the following institutions:

- NOVEM Business Park situated in Holstebro, run by a number of municipalities in the area. A number of the employees are to render service and assist enterprises that chose tenancy in the park. These are especially active in knowledge-based service trades. KCFD also resides in the park.
- HIH Development is one of the state approved innovation environments with the possibility of delivering invested capital in new innovative enterprises.

- Herning Institute of Business Administration and Technology offers various types of educations and runs different types of business-oriented research activities, e.g. in co-operation with the Centre of Applied Management Studies at Copenhagen Business School.
- Business Academy Mid Jutland Innovation is to assist in connection with concrete problem-oriented question from SMEs in the area and strengthen the practise-oriented competences in the education environment of the Business Academy Mid Jutland. Its residence is in Herning.
- TEKO Centre: This institution is specialised in covering educational needs in the clothing and textile sector in Denmark. It lies in Herning.

In *Viborg County*, one can especially point to the following institutions:

- OEM (Original Equipment Manufacturer) is a competence network of sub-contractors that delivers significant input to a customer's end product. It takes part in a larger national innovation project called Innolink, with state support.
- Danish Shellfish Centre is a development centre that has the purpose of developing methods for sustainable breeding of shellfish and assisting enterprises in the sector. It has close co-operation with research institutions. It lies in Nykoebing.
- Agro Business Park is a state-approved research park situated outside Viborg.
- Network Limfjorden works with further developing the Snapseruten (Snaps Route), which is a tourist promotion project with ingredients of travelling by boat and foot, experiencing nature and gastronomy.
- Growth co-operation for Morsoe-Sallingsund – co-operation between municipalities and the Ministry of Economics and Business Affairs – planning of broadband network for all in the region, pilot project regarding the Limfjord House in Glyngoere (inlet-related tourism), business development strategy for the growth co-operation.
- Public Centre in North West Jutland for Renewable Energy.
- Danish Institute of Agricultural Sciences (institute under the Ministry of Food, Agriculture and Fisheries). One of more branches of the institute resides in the study area, in Foulum.

Table 13. Relevant schemes and institutions in the study area

Innovation	*Regional policy*	*Rural district policy*	*Tourism promotion, specific*	*Food promotion, specific*	*Promotion of the wood and furniture industry, specific*
NOVEM Business Park	Objective 2, Interreg and others.	Art. 33	Limfjorden Network, Snaps Route	Danish Shellfish Centre	Development Centre for Wood and Furniture
Agro Business Park	Business service centres Local business offices	LEADER+		Knowledge Centre for Food Development	
Public Centre in North West Jutland for Renewable Energy	Growth Co-operation Morsoe-Sallingsund			Dynamo Project	

2.3 Findings from the study of the agrifood industry

2.3.1 Background information

Number of interviews and categories of interviewees

Fifteen actors were interviewed: 4 farmers, 5 processing companies, and 6 supporting agents. See Appendix 2 for a description of interviewees.

Characteristics of interviewees and the entities they represented

The selected two branches within the agri-food industry, breweries and dairies, guided the choice of interviewees. The two branches' value chains were followed:

- Brewery ← malt house ← feeding stuff company ← malt producer
- Dairy ← milk producer

All eements of the value chains are present in the chosen study area. When selecting which of the companies in the region that should be contacted, focus was on the local/regional perspective. Bigger companies that only had local branches in the region were excluded, while locally based companies were preferred. As there are no local feeding stuff company left in Denmark, this link in the product chain had to be covered by a local branch of a bigger company.

The two selected branches also guided the choice of supporting agents, but generally the group of supporting agents have a more general interest in agriculture and food production than merely breweries and dairies. Specialists only working with one of these branches as e.g. branch associations are not situated in the region.

Of the four farmers, two are plant producers of malt barley, while the other two were milk producers with 65 and 90 cows. Three farmers are organic. None of the farmers had permanent employees, but two of the farmers' wives were working full time at the farm as well.

As for the processing companies, two small local breweries were interviewed, as well as a malt house, a local organic dairy and a local branch of a large national feeding stuff company.

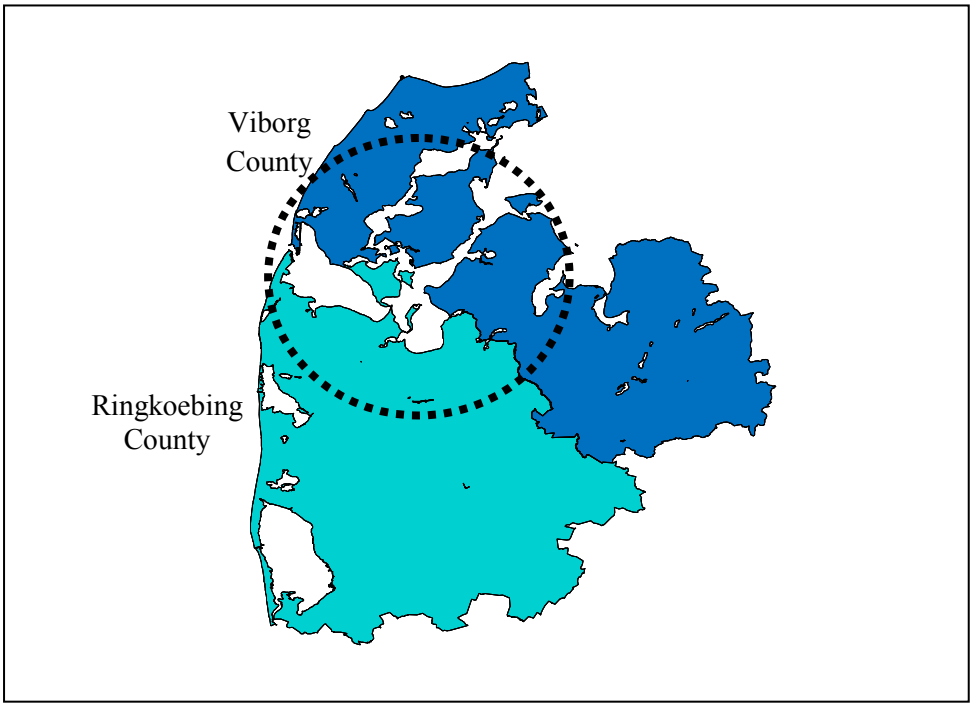
The six supporting agents consist of three schools, one development agency, one farmers' association and one public authority.

The three schools have very different profiles. Northwest Jutland Education Centre (NVU Thisted) was contacted because the school's development department has prompted several regional projects on learning and competence development in the region's business life. The agricultural school and the technical school manage a 2-year course in process technology for skilled workers in the food industry.

The interviewed development agency, Knowledge Centre for Food Development, is very new (established in 2003), while the farmers' association will celebrate its 150 years anniversary in 2006.

Finally, the interviewed public authority was the development agency at the business and labour market department in Viborg County. Compared to similar departments in other counties, this is an unusual big department on these matters initiating many different initiatives on regional development.

Map 7. The agri-food industry study area



2.3.2 Knowledge and competence base

All respondents draw up a general picture of a low education level in the food sector. All supporting agents deliver different kinds of knowledge-input to farmers and companies. Several of them point to the fact that the regional food sector is characterised by small companies with a real entrepreneur as owner. The typical owner does not have much more education than primary and lower secondary school, but he/she has many ideas, is skilled, is good at talking with people and makes good deals. This background is seen as a barrier by the supporting agents in relation to the company owners' own learning, but also in relation to the education of employees and especially in relation to the employment of academics.

The supporting agents thus call for employees with a higher education at least among the managers of the companies. This could provide stronger basis for new thinking and education of the employees. On the other hand, the respondents from the companies draw up a picture where the leader of the company has a university degree (as the only one). This difference could probably be explained by the fact that in the two studied branches (dairies and breweries), university educations traditionally form the background for the ownership or management profile. This is not the case in all other branches in the agri-food industry.

According to statements from the supporting agents the education level is most up-to-date in the bigger/big companies. Likewise, the SMEs generally show a lesser interest in getting their staff further educated. Nevertheless, the supporting agents point out that this lesser interest might be due to the fact that the SMEs are more dependent on their key employees, that is, in contrast to the big companies they are not to the same degree able to take out a man of the production line. The interviewed companies, where the big/bigger companies work most

actively with organizational and staff-related development, while this work is almost absent in some of the smallest companies, also reflect this tendency. Only one company had a management that worked actively with, and earmarked working hours for, development of the organisation, the staff and the management. In the other companies, this was an aspect where resources were willingly spent, but the work was not formalised to the same degree.

In the companies, the present technical skills are generally promoted via trainee arrangements, where the apprentice follows a work colleague for a week or two and in that way learns all the working processes that are related to a special job function. To a certain degree, the companies also utilize courses lasting one or two weeks to become updated professionally.

The interviewed companies point to following concrete knowledge demands:

- Flexibility of the staff
- A higher degree of technical specialization
- More knowledge on sales and marketing

The farmers demand:

- More IT-knowledge
- General courses e.g. folk high school courses

The supporting agents point to the following demands:

- Good export salespersons
- Some masters in business and finance in the management offices
- The idea of upgrading people who serve in jobs in which they are not educated
- Farmers have a great demand to meet others and get some professional discussions and inputs
- Farmers should be challenged by new ideas. Regarding the introduction of new products it is about knowledge on market analysis as a tool, about organisation and sale.

Regarding the efforts and interests in sustaining or expanding the knowledge and competence base, both companies and supporting agents point to internal company learning supplemented by courses in the local schools (technical schools, commercial schools etc.). None of the companies or the farmers gives the impression that they miss certain educational possibilities for themselves or for the staff. Rather than employing a person with a higher education, the companies seem to prefer to find new employees that have the right combination of competence and qualifications that are able to fill in the all-round functions that are often expected by managers in small companies.

Box 2.3.1 The all-round generalist at the brewery 'Thisted Bryghus A/S'

The informant is assistant director/sales manager (depending on the circumstances). When he was employed, the informant was directed to develop the brewery: to introduce 'something new'. It was a condition for the job that the informant would make the brewery a success. If he succeeds, the intention is to make him managing director. The informant is not university-trained; he is an accountant and has a lot of practical experience with production control from his former employment. Furthermore, the informant has a large and broad professional network and he grew up in a (local) grocer's family.

When employing new managers, several companies ask for an element of new thinking in combination with already acquired knowledge from former jobs or the like.

The respondents from the course in process technology at Holstebro technical school point to the demand for construction of competence within hygiene, traceability and product development especially for 'high convenience products'. Several supporting agents incidentally point to the general lack of academics in the management offices as a problem when it comes to making companies identify and overcome competence related barriers internally. A regional analysis on competence clusters in Viborg county points to the same common denominator of competence as having a major influence on the food sector in the region[68].

About 31% of the asked companies in the competence cluster analysis say that it is to some degree difficult to obtain qualified manpower. A demand for upgrading of unskilled workers in the food sector will arise, because the group of unskilled workers should be able to fill out the place of a skilled worker in the production line. In that connection, no problems of recruitment are expected, because the companies themselves handle the upgrading of these groups that are often already a member of the staff[69]. This corresponds to the findings of the ISP-study that are referred below.

The interviewed companies in the ISP-study say that the amount and quality of local and regional offers on education, courses and advice and consultancy assistance is sufficient, almost abundant. Some state that the amount of information materials from the education is too much. On the one hand, it implies that one always knows where to turn, but on the other hand, it has the consequence that much of the material is thrown out unread. TIC (Technological Information Centre) in Viborg is accentuated as a good place to seek information. Among the supporting agents several point to the new VIFU as the place that could take over the food related questions from TIC.

[68] Oxford Research A/S (2003a)

[69] Oxford Research A/S (2003b: 77)

(Pilot study on employment in three selected clusters: Furniture and wood; Food, Metallic industries). Here, it is noted that the number of companies answering 'do not know' increases from 7% for unskilled workers to 55% for longer educations. This is assumed to be due to the smaller companies having very little experience with recruitment of persons with a longer education, and thus not being able to assess whether it is difficult

Box 2.3.2 VIFU an example of a new innovative co-operation

VIFU (Knowledge Centre for Food Development) is established under the Jutlandic and Funen Trades and Industry Co-operation. The task of VIFU is to be bridge builder between food sciences and the food trade and industry. VIFU has a consortium with 11 parties concerned: Northwest Jutland Education Centre, Holstebro Technical School, The Royal Veterinary and Agricultural University, Technical University of Denmark-BioCentrum, Danish Technological Institute, Bioneer, CVU-VITA (Centre of Higher Education) Holstebro, MAPP (Centre for research on customer relations in the food sector), NOVEM (Science- and Business Park), Farmers' Association Holstebro-Struer, and Province Centre Middle-West.

VIFU points to the mismatch between the fact that a large part of the Danish food production takes place in western Jutland, while all knowledge institutions in the sector are placed in the eastern parts of Denmark. To rectify this imbalance and create an innovative environment for food companies placed far away from the knowledge centres, a special effort is demanded.

The Danish farming sector is thoroughly organised also when it comes to learning and courses that are carefully adjusted and target oriented towards the possibilities and demands of the farmers. As the number of farmers is still declining it is said that there are two advisers employed for each active farmer. The fact is that there is a great demand to get the farmers to use the many existing offers on advice, courses and knowledge development. The agricultural schools are e.g. each other's worst enemies as they –together with all other knowledge suppliers – compete to convince the relatively small group of young people to go the agricultural way and compete to attract the still smaller group of farmers searching for in-service training. This implies that every imaginable corner of the farmer's daily life is uncovered to reveal places where a course could make the difference. At the same time, there is a long tradition in agriculture to follow courses during wintertime. Hundred years ago, courses were held at the folk high schools, today they are held by professional course providers.

2.3.3 Innovation activity

Some of the work in the Jutland-Funen Business Co-operation is about uncovering the differences in the innovation activities between the different parts of Denmark[70]. The Jutland-Funen business report points to the food sector as a very important resource area for the region. The innovation activity in the Jutland-Funen food companies does not differ much from the average among companies on Jutland-Funen in general or from the food companies in the metropolitan region. While the part of innovative companies in the food sector is 51% in Jutland-Funen, it is 59% in the metropolitan region. Innovative companies are in this connection defined as companies that have stated to develop new products or production methods in the periods of observation[71].

In the food sector in this region, but also in the rest of Denmark, workmanship is abandoned in favour of an automated, industry based production type. In itself this change gives a higher degree of innovation in the sector.

[70] Jysk Fynsk Erhvervsredegørelse (Sept. 2004), http://www.jylland-fyn.dk/wm1

[71] Erhvervsministeriet et al. (2000:97-99).

The respondents have stated a wealth of different development processes and innovation related projects. The supporting agents point to the following projects that they have been or are involved in:

- A project on stable cleaning (chicken)
- A project on securing quality in the broiler production
- A project on network building among companies and development of contact to knowledge institutions
- Three cluster projects (metal, wood and food industry) regarding competence development for the low-educated part of the employees
- A network project for small food producers
- A development of the training place course for pupils from agricultural schools
- A new and shorter education in agriculture and gardening
- A project on agriculture as the generator (dynamo) for a sustainable development in the rural districts (the Dynamo project)
- The establishment of a smell laboratory. The laboratory mainly deals with problems related to slurry
- Support for the establishment of a regional development agency with focus on food development (VIFU – see Box 2.3.2)
- Support for the establishment of "Klejns Food Market" in Thisted
- To help farmers finding the production type that fits their situation of life and other wishes
- Development of a new type of advisory service "binding advising" – an interdisciplinary model for advising containing both short-term goals and a long-term plan of action
- Lemvig Market and Cattle Show

The latest innovations stated by the farmers were:

- New building of a cattle stable
- Renovation of a stable for young livestock
- New clamp silo
- New concentration on grass fields (because of changes in the CAP) demands new investment in machinery
- Investment in a second milk tank on demand from the dairy
- Continuous investments in the newest machinery (latest a sowing machine)
- Development of a sideline with hiring out vintage cars with driver for weddings and the like
- The tender start of a co-operation between local organic plant producers to promote marketing

- Active work with new strains and crop types
- Continuous development of own machinery (latest a special hoeing machine for the field with wheat)

Among innovations stated by the companies were:

- An integrated system for quality and food security that gives the opportunity to become ISO 9001 and HACCP certified
- Reorganisation of the sales work has released manpower for new (export oriented) tasks
- Development of a new product that showed the need to focus on quality not on price
- Opening the company towards a new group of customers via a new shop concept
- Investment in new machinery to raise product safety and to relieve the work for the staff
- Launching of a new product to raise the quality image and the profile of the company
- Constant launching of new products – product development is a business concept
- Reorganisation with more responsibility on the floor relieves manpower for new thinking and learning among managers

The two small local breweries have experimented with introducing quality beers as a supplement to their normal, regional beer. Both have been successful in doing so, and therefore they contemplate to offer quality beer of various kinds more permanently in future. In the little dairy, they continue the creative product development track, which has been successful during the latest 10 years.

Among the farmers, in the malt house and in the feeding stuff company, competition is intensifying and in some cases there are clear signals of crisis. The solutions that the company owners have chosen are very different, as it is shown in the list above. Some choose just to let things be as they are and hope to manage anyway. Others follow up the external demands by introducing rationalisations, offering courses and/or working on the attitude among the staff. In this way, they try to follow the demands of the market through a slow adjustment. Others again start up a proactive development by enlarging their production and go up-front with the newest news but without compromising their ideals.

Box 2.3.3 An example of an offensive approach to development

Organic milk producer: ”Last year we increased production by 1/3 (both land and cattle), we changed the rotation of crops, we built a new cow house with a feeding system which enables us to feed only once a week, and we had a milking robot installed. It is still a smallholding – and so it will remain. I consider it difficult to combine an active summer grazing with real big herds like for instance the herd of 250 cows and four milking robots, which my organic neighbor has.”

The supporting agents also draw up different pictures. Several suggest that the bigger companies probably are a little quicker to engage in innovative development processes. On

the other hand, they also point to the fact that many of the big companies have disappeared from the region in the latest years. Now it is more up to the remaining companies to make sure that business development takes place in the region and that this fact is reflected in the greater conscience in the population on the demand for new ideas and the back up of entrepreneurs.

The supporting agents point to economy and public regulations as the two most important motivation factors for changes in the companies. In this connection, one of the supporting agents states:

> "It is our impression that especially the soft qualification ought to be developed. But nevertheless we have many who look at hardcore data; does this machine process more fish? That is, the interest in upgrading the soft qualifications depends on whether the invested time etc. is returned again in the other end. That part can be a bit hard to prove".
> (Interview NVU Thisted)

The economy, the bottom line, and the public regulation are important drivers to innovation by and large confirmed by the company owners – even if especially the part about regulations, bureaucracy and paper by one respondent is pointed to as having very negative consequences for the development of the company. Here, the "*administrative bother*" is only seen as a strain that demands first priority.

Supporting agents, farmers and company owners also point to other innovation factors, e.g. demands from customers, the problems of emigration from Western Jutland (and the companies' responsibility in that connection), the company owners' and managers' personal circumstances (inclination, curiosity, health, family considerations etc.).

Among the supporting agents, there are many different views on companies' interest in engaging in innovation and development projects. Some have the opinion that the companies are interested, but that they lack time. Others point to the knife-edge competition in the food sector that in a too high degree leaves the initiatives to diverse project oriented consultants. In the farmers' association, "*the inclination to do something that the neighbour has not done*" is seen as an innovation driver for the individual farmer. From the association's side, it is just noted that some have the money to follow their ideas without problems while others have to arrange themselves with a poor economy in order to do the same.

When it comes to the identification of key actors in the development process, an interesting difference between the study's respondents can be traced. In the locally anchored companies, there is no doubt about who is driving the development, namely a person from the management team, possibly in combination with some of the practical guys of the company.

Box 2.3.4 The central actors at the brewery of 'Hancock A/S'

The informant (who is the son of the enterprise owner): "We attend a fair in Germany once a year and see all the news related to this line of business. It is me, my father, the metalworker and the electrician who go. We make it a real 'Gentlemen tour' […] When we get back with a good idea, we take a look at the money. This is where we have to ask Jørgen [the chief accountant], if he has a million for this and that."

In the interviewed feeding stuff company, which is only a tiny branch of a very big group, all developmental initiatives start centrally. The local actors do not have a deeper knowledge on who is carrying them and why they come. The line of command is unequivocally top-down. A motion the opposite way, where an idea starts locally and is presented to the central parts of the organisation, is seemingly not very used.

The company owner or manager is the leading actor both pointed to by the supporting agents and by the companies themselves. It is also indicated that the manager can function as a barrier for development when he is against an idea. One of the company respondents, however, thoroughly explains about his perennial work to broaden the remaining management's opinion on development and how big a difference it made when they went along after having been against it in the beginning. The supporting agents describe the company owners' entrepreneurial gene both positively and negatively. One emphasizes the urge for independence and instinct of self-preservation as the motor that drives the company manager to continue the daily work and involvement. Another one emphasizes that exactly this type of company owner at the same time is a barrier for learning and competence development (both towards himself, the management group and the staff), because he uses his own, often insufficient, education to disprove the need of learning.

The companies show up a very big difference in the number of unsuccessful attempts. On the product development oriented dairy, they estimate that about half of the initiatives are unsuccessful and that this is very expensive. Nevertheless, this is seen as a necessary cost in a production that is so developmental. The respondent emphasizes that it is more important to be up-front in a development process than to reckon all the good ideas to pieces: "*If we had begun calculating, we had never got started*". The opposite opinion is also represented. For example, one respondent says that their company does not have the money for unsuccessful attempts. That is why this respondent has chosen to be awaiting, cautious and take care thoroughly to investigate all imaginable parameters before investing in something new, launching a new product or what so ever.

However, unsuccessful attempts are not necessarily connected to launching new products. For instance, one company has tried to initiate a professionalisation of the board partly by proposing another composition of the board and by introducing a number of possibilities for competence developments for the existing board members. Even if this attempt did not succeed in the first round, the respondent has not given up and will try again with more power, once a row of practical problems in the daily work of the company are solved.

Among the company respondents and the farmers, the technical and building related conditions for the production are generally emphasized as an internal barrier. Some cannot extend the buildings of the company because of surrounding urban area; others have to get the best out of either very old equipment or rather new equipment that has already become

outdated. A few respondents point to human factors such as fear towards innovations, reluctance to change and lacking interest in long-term investments. The lacking time or surplus to 'think big' and strategic is by others emphasized as a problem.

Almost all respondents from farming and food companies can point to innovations that go beyond the individual enterprise. In several cases, such news are related to organics, e.g. Thisted Bryghus launching the first organic beer in Denmark in the mid-90s. In the remaining cases, the innovation is about development of machinery or technology that is later taken up by others in the sector. Some farmers, company respondents and supporting agents point to the different cooperating structures and networks that are established between the producers as being very innovative.

In the near future, all companies and farmers will work with many different novelties. It is about introduction of IT in the production, about systems for food quality and safety, about product news and new machinery. On the slightly longer term, the tendency by all respondents is that they imagine that the present structural development both in farming and business will continue in a way that will force the single units either to become bigger/more effective or that the single company will find their own special niche. In this connection, Thise Dairy visualises a both/and, meaning that their perspective for the next 5 and 10 years is to become a much bigger dairy that still "*makes the things that others cannot make or do not bother to make*".

2.3.4 Cooperation and networks

Generally, the answers from farmers and industry indicated that the ones with networks and many contacts were the most innovative ones (or the most innovative ones had the most contacts. In the company with a parent company, all central contacts are made by the parent company while the local branch primarily have contacts to customers and other local actors.

Suppliers, competitors and other companies, public authorities and financial institutions are the actors that are marked most often by the respondents as co-operation partners in relation to innovation activities, see Appendix 1, Table A1.1. But co-operation can be understood in many ways. Some companies actively and constructively interact in wanted co-operation arrangement with e.g. authorities, while others are forced into a sequence of events where the authorities set up all efforts and targets. Where co-operation is forced on to the company the contact is not positive – here the company rather tries to find ways to avoid further contact.

Box 2.3.5 Of the case companies, the organic 'Thise Dairy' has the largest network

Thise Dairy describes itself as a developmental dairy where innovation is the only constant. The inspiration for the continuous process and product development is inspired by and rooted in a network including all the mentioned parties in the questionnaire (except for developing agencies and consultants, which Thise have chosen to do without, as they: "do not want to be a part of that pudding"). Instead, Thise is e.g. represented in several governmental and scientific councils, boards and committees whereby the dairy gets hold of the latest developments in politics, science and management.

Looking at the frequency of contact, competitors/other companies range highest with suppliers graded second. Many of the respondents, especially the farmers and the small companies, also point to the contact with neighbours as important in everyday life. Regarding the location of the networks, the group of farmers are the most locally minded of all respondents. The supporting agents work on a regional and/or national arena, while the interviewed companies present the most international contacts and the most fragmented picture of all three groups. Nevertheless, there is a clear relation between the level of export and the company's international contacts.

The picture of important and tight contacts to suppliers and competitors/other companies is confirmed by the analysis on innovation made by the Danish Ministry of Food, Agriculture and Fisheries, here 127 companies in Denmark answered the question about where they were acquiring the necessary knowledge on product and process development[72]. 37% pointed to suppliers while 34% pointed to competitors/other companies. But in that analysis, the companies' customers were the ones that ranged highest with a score of 58%. Compared to this, three of the five companies interviewed for ISP stated that they were co-operating with customers on innovation activities. In the analysis of innovation, it is particularly emphasized that information from nearby sources are essential for the food industry, while the companies to a lesser degree communicate with private or public research institutions[73].

A large national research institution on agriculture is placed in the southeastern part of Viborg County[74]. All interviewed farmers emphasize this research institution as an institution they know and to which they have relations. One of the companies and two of the supporting agents mention this research institution as well. The small group of interviewed farmers had a strong bias as we intentionally compounded the group of farmers with two very innovative and knowledge seeking farmers and two farmers who were just doing business as usual. But nevertheless, when comparing companies and especially supporting agents with farmers the farmers' group was generally the one with fewest contacts, while the supporting agents had the most numerous and heterogeneous contacts.

Regarding the level and range of contacts of the supporting agents, a very dispersed picture is emerging. As expected, the only interviewed administrative unit, the county, can display the most both formal and informal contacts of all respondents, see Appendix 1, Table A1.2. Other supporting agents that are subordinated a parent organisation have much lesser especially formal contacts. Generally, the age and size of the organisation seems to have a lesser significance for the number and quality of contacts than has the organisation's purpose and work style. The supporting agents that work on a project basis generally have a large network, but do not use the entire network all the time. They work ad hoc and use the network in the same way. This is very different from the farmers and the companies that generally have build up their networks through years and have many considerations if they for some reason should be forced e.g. to find a new veterinary surgeon or supplier of packing materials.

[72] Ministeriet for Fødevarer, Landbrug og Fiskeri (2003:72).

[73] Ibid (p.72).

[74] Danmarks Jordbrugsforskning (October 2004), http://www.agrsci.org/

Half of the interviewed supporting agents had difficulties in distinguishing between formal and informal contacts because the respondents had both formal and informal contacts with the same parties.

Box 2.3.6 An example of the mix of formal and informal contacts

At the Technical School in Holstebro, formal meetings are held 3-4 times a year between student advisers and education executives from all the other further and higher educations in Ringkoebing and Viborg counties. The official purpose is to arrange 'Study-Saturdays' to attract new students, but it is the informal talk that is seen as most important by the participants.

The other half of the supporting agents could part formal and informal contacts and did so. As an example, the farmers' association could be mentioned. Here, all formal contacts go through the parent organisation, while the local branch that was interviewed for this study named a large number of various and often used informal contacts.

No respondents mentioned new future contacts. Most respondents envisaged that they would continue with their existing contacts possibly in an extended version, while others thought that they would find and build up relations to all the contacts they needed if they should be confronted with new and yet unknown problems in their future production.

2.3.5 Innovation conditions

All the interviewed farmers know and utilize relevant support programmes and they are very aware of the coming reforms of EU's common agricultural policy. They all try to accommodate their production to expected short-term and long-term changes. They mention the following types of support:

- Support for conversion (from conventional to organic farming)
- EU's hectare support programme
- Organic support programme
- Environment determined support
- Support from the animal welfare law
- Support for particular sensitive agricultural areas

The companies do not show up the same common picture as the farmers. The companies seem to know less about public policy and support regarding their field of business than the farmers. Two companies draw up the scene by being complete contrasts. As already mentioned, the development dairy Thise is working actively to get political influence nationally and locally through representation in various councils, boards and committees, while another respondent rejects almost every public support approach. While Thise is very aware of, and utilizes, all relevant support programmes, the other company considers the work connected to get out money from the programmes to be too comprehensive and not worthwhile. The remaining companies are placed in between these two opposites.

The following quotation is included to illustrate Thise's involvement and broad knowledge of the field:

> "The present government took away the support for the food industry from the rural programme. That impressed us in a very low degree. The government says: "Denmark in balance". They do not wish any balance, they just wish to get votes where there are votes to be gotten in the Triangle Area, in Aarhus and in Copenhagen. The rest of us can go and jump in the lake. […] It is simply a lie that we have an industrial policy that basically gives the same education possibilities; the same cultural offers etc. to everybody. And when they then additionally take away these parts of the EU-programme, then it is simply too much. That was the second time in my career that I obtained an audience with the food committee of the Parliament. […] The building society would rather lent out money to a food producer that is placed 200 meters from E45 than to us up here. That is why it is very necessary to have support programmes to equalize the rural disadvantages we have by not being placed where infrastructural investments are placed, especially when they say that they want a "Denmark in balance". (Interview Thise Dairy).

A daily task for some of the supporting agents is to relate directly to the current political situation nationally, regionally and locally. This, combined with the fact that most of the supporting agents have some kind of advisory role in project development for primary producers and companies, creates a picture where the supporting agents are very aware of political initiatives and the political development on the whole. They have a very good knowledge of the different support programmes in the sector and can point to shortcomings in the programmes or at sectors and initiatives that are difficult to cover with the existing programmes. But after all, two of the supporting agents say that if they find an idea really good they could always find a programme supporting it.

Box 2.3.7 An example of a new administrative practice to raise regional development

Viborg County has chosen to revise the normal way to consider applications for funding. Instead of having closing dates for applications, case officers assessing each case, subsequent sorting the cases into two piles for approved and rejected, the county has introduced a new system. Here there are no closing dates for application and the applicants are urged just to hand in rough outlines with their ideas. Then these ideas undergo a preliminary assessment, where some get the message that their ideas do not have the potential. Conversely, the good ideas are caught up early, making it possible for the administration to work proactively with the idea together with the applicant almost from the start. Coming so far that an application form has to be written and assessed to get the idea financed and realised, another case officer than the one sitting with the case every day would complete a normal treatment of the case.

The respondents point to different external barriers for innovation or other hindering factors. The organic farmers have met special problems related to organic farming; one talks about being a subject of conversation while converting the farm; another is annoyed that he has to *"come crawling on my knees to offer my splendid organic produce for sale on lousy conditions because there is no demand from the market"*.

The companies reiterate some of the same barriers and hindering factors that they already mentioned as internal barriers, as e.g. the problems related to the placement of the production in the middle of housing areas that hinder enlargements of almost every kind. One respondent

in particular sees public regulation as a major barrier. As he puts it, "*public rules, the taxes and duties are all intentionally invented to bother private companies that just try to get peace to make some business*". One of the companies exports most of the production and imports the raw materials as well. This company points at the very disadvantageous location of the production in a corner of the country without motorways and international harbours. Other companies point to more production related factors as e.g. to be able to get the adequate amount of raw materials for the production or to the importance of finding the right collaborators that are committed and willing to make quick deliverances of small amounts of e.g. packing in the agreed quality.

Both companies and farmers point to the national level when asked for facilitating factors. There is only mentioned one factor below this level, it is mentioned by one of the milk producers who emphasizes the importance of success for the little local dairy: *"when it goes well for the dairy it goes well for us – we stand shoulder to shoulder"*. The other factors mentioned are partly connected to political decisions on a whole and partly to support programmes and other programmes. Generally the respondents emphasize that external requirements at first look like huge barriers, but that they can be conducive to exceed limits that would not have been perceived and exceeded without this external 'push'.

The perception of the general attitude towards innovation in the region is very outspoken by farmers and companies, while the supporting agents are more cautious in their way to express the matter. Among farmers and companies the opinion on the matter is bipartite. On the one hand they point to the regional population as being reticent towards news – they are not the ones standing in the first row. On the other hand they sketch up the growing understanding of the importance of maintaining jobs in the region. This growing understanding opens up for a more positive attitude towards entrepreneurs with unconventional ideas and other initiatives e.g. from the public administration that can help to pull development in the right direction. More respondents point out that people generally hold self-employed in big respect.

Box 2.3.8 An example of a new semi-public initiative to raise local business development

One of the farmers was just invited to join a local think tank. It has been initiated and is lead by the leader of the museum in the municipality. 26 selected persons from the municipality were asked to join - nobody refused. The aim of the think tank is to strengthen the area through new ideas on tourism, business and to think in options that are also relevant and interesting for the residents in the municipality. One of the tools that the think tank will use proactively is storytelling. Here the connection to the museum is invaluable. the think tank will use proactively is storytelling. Here the connection to the museum is invaluable.

The supporting agents once again point to the food industry as cumbersome and slow as regards competence development and education at all levels. But at the same time, they state that the sector is progressing and catching up. The entrepreneurs are good at implementing new ideas, but they very seldom work beyond their own factory e.g. for the region in general. Everything stops once the ideas are realised in a production line.

2.4 Findings from the tourism case study

2.4.1 Background information

Number of interviews and categories of interviewees

In total, 13 were interviewed. Five represented tourism operators, three firms offering services to the operators, and five supporting agents. See Appendix 2 for a description of interviewees.

Characteristics of the interviewees and the entities they represent

All the operators represent micro enterprises. They are located in areas not traditionally associated with the main segments of the large scale Danish North Sea tourism. Two are operating as agents offering chartered sailing/fishing trips/excursions. Another two are offering products that can be connected to "farm tourism" in a broad sense. The last operator chosen runs an aquarium and has also taken the lease of coastal experience centre located nearby.

Three companies were chosen as the intermediary firms, meaning that they in some sense offer services to the tourism industry. One is a local newspaper that publishes a tourist newspaper during the high season. Another is a multi media company that also offers a special tourist paper, in addition to services like construction of homepages, portals and technical computer support. The third company operates in the transport business, running a coach company with local transport routes and coach travel, both inland and internationally.

Of the five supporting agents, two are public authority representatives. From the Regional Development Department in Ringkoebing County, the informant was involved as a project manager for a LEADER+ tourism project[75]. The informant from the Development Agency at the Business and Labour Market Department in Viborg County is involved as a regional tourism consultant.

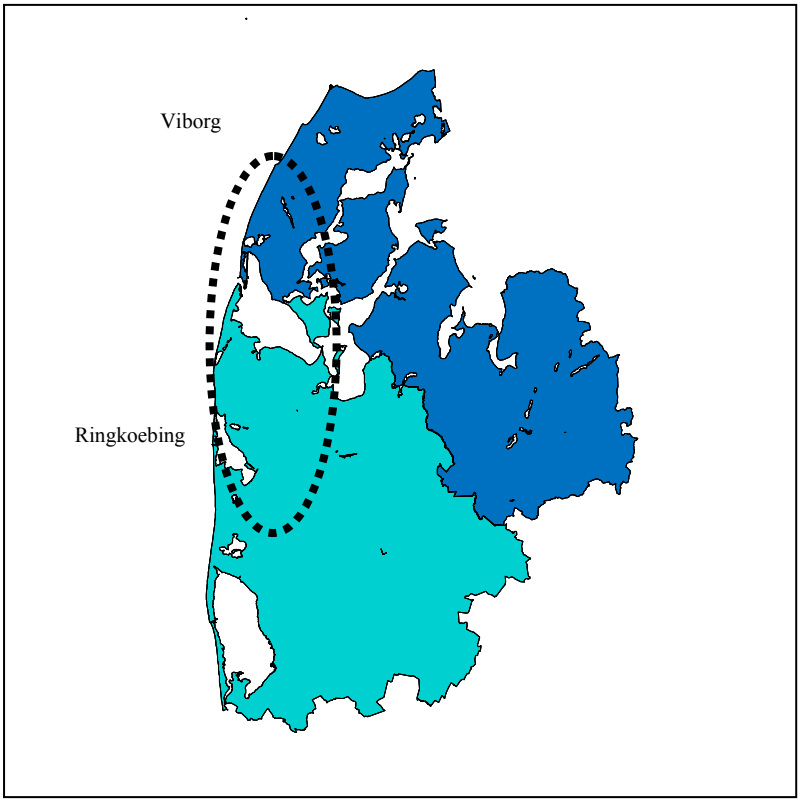
Another important supporting agent in relation to the tourism industry in the region is the regional tourism organisation, responsible for marketing and development of tourism. On the level below, the regional organisation there are also a number of Destination companies in the study region. Two informants represented Turistgruppen VestJylland (TGV) and Destination Thy, respectively.

There are no educational institutes specialising in tourism in the study region[76]. Therefore, the educational institute Nova Media, of a regional television channel (TV Midt Vest) is selected. The main reason is that this institute is responsible for "Web Tourist", a part time multimedia course (2003-2005) that targets candidates from the tourist industry. The informant is the course project manager. "Web Tourist" is developed in co-operation with the regional tourism organisation.

[75] www.leaderplus.dk

[76] After the field work for this study was finished a Hotel and Restaurant school (EUC Midt) has been established in Skive (August 2004).

Map 8. The tourism study area



The firms are not chosen on the basis of their involvement in the same networks. They are distributed throughout the region, all being locally based. Three of the supporting agents are physically placed slightly outside the area encircled, due to administrative structures, but operate in the study area region.

Innovation in tourism

Before presenting the primary data, the attention should be drawn to the concept of innovation and tourism[77]. The concept of innovation has its origin in the producing industry, and it is clear that the production of goods and the production of services involve slightly different processes. When referring to innovation in tourism the following types have to be recognised:

- Product innovation (new tourism products or services).
- Organisational innovation (new organisations and management styles).
- Process innovation (new ways of communicating the tourism experiences).
- Logistical innovation (new ways of delivering products and services to the customer).
- Market innovation (new types of marketing and consumer behaviour).

[77] Tetzschner et al. (2002) and Jensen et al. (2001/2002).

The service industries are characterised by a relatively informal innovation process, and many of the innovations are non-technical. The fact that many of the service innovations are small improvements of existing products or processes makes it difficult to measure them. The innovation mentality is unknown to many firms in the service industries, including the tourism businesses, even though innovation is actually taking place[78].

As we find in this study, it is difficult to categorise and isolate something as innovations within tourism, both for the operators, supporting agents and the researchers. In chapter 2.4.3, there is an attempt to classify some of the major novelties that the operators and supporting agents in the study region are engaged in.

2.4.2 Knowledge and Competence base

Danish tourism is characterised as a sector with relatively low wages and very seasonal employment. These are factors that work against attracting well-educated employees in the long run (although many students work part time during the summer seasons). Still, there are examples of operators with high education levels in the case study. These are typically involved in tourism as lifestyle entrepreneurs (see below).

Generally the supporting agents also see the (formal) education level to be low in the region's tourist industry. This is also the fact on national level, where a survey shows that tourism as a sector has fewer positive preconditions for innovation than other service industries, including the lack of a well educated workforce[79].

When characterising the operators there are different motivations for being involved in tourism[80]. There are those living out their dreams, and with the motivation to be independent and do something special (lifestyle entrepreneurs). Another group are those to whom employment in tourism is the only possibility (necessity entrepreneurs). Finally, there are operators mainly interested in doing something for their locality, and thus have a collective motivation. This collective motivation is made visible in the amount of volunteers that are involved in local projects. Differences like this will obviously have an effect on the motivation for acquiring knowledge and competence, and the willingness to participate in new projects.

The firms chosen for this study represent different levels of education, with the majority of the employees having a vocational background. Depending on the nature of the firm, you will find that both informal as well as the more formalised manner of obtaining new competence are visible. This is typically ranging from searching for information on the Internet to attending courses arranged by educational institutes (i.e. construction of homepages, marketing, upgrading of earlier education, technical skills). An example is the "Web Tourist" course provided by Nova Media where we find participant from both operators and intermediary firms. See Box 2.4.1.

[78] Jensen et al. (2001)

[79] Erhversministeriet (2000).

[80] Different motivations can be combined in the same operator, e.g. living out their dreams and doing something for their locality.

We also find an example of a competence development project, aimed at tourism directors in two counties, arranged by Mid-North Tourism[81]. The programme was completed in 2003 after 2 ½ years with ten modules covering a divers range of topics. Measuring success or competence that was developed is not an easy and straightforward task, but as the informant from Viborg County observes, participants have expressed satisfaction with the programme. One distinguishable success is the improved networks and the co-operation that has come out of it. See Box 2.4.7.

Another important form of acquiring knowledge and competence is the "learning by doing" process found in the small firms. It is necessary to have multiple skills, which usually are acquired through practical experience. Being able to handle very diverse forms of challenges is obviously the most economic solution for smaller firms/family firms. A relevant way of upgrading the competence is the process of learning from each other. As emphasized by several firms the daily exchanging of information between the employees is the most important way of upgrading the knowledge level.

Since the chosen companies are all smaller firms, it is not possible to distinguish if the size of the firm matters for the K&C base. However, when speaking of the industry in general terms, the supporting agents have an impression of larger firms having a more developed level of knowledge and competence (at least the "formal").

What the operators are lacking when it comes to C&K is by the supporting agents mentioned as the following:

- K&C about how to upgrade their existing product basis
- The ability to see new possibilities and be able to break the natural scepticism.
- K&C about service, having the ability to see what their customers want
- General upgrading of language skills and ICT skills, both technical and promotion wise.
- Knowledge of how to approach the media, how to make a good press release.

In general, some supporting agents also find that some operators lack a broad overview or understanding of the mechanisms and magnitude of the sector, and that they do not spend much time on defining the role of their businesses in this context. The main strength of the tourism operators is that they inhabit knowledge of the local and of their market. This is a competence they have developed over the years by experience, not so much by formal education, and represent a form of tacit knowledge.

According to supporting agents, there are operators that always see new possibilities and some that do not. The last group feel that they do not need any "external" inspiration (K&C). They tend to close their eyes for new possibilities; their scepticism prevents them from improving their businesses in the long run. The positive thinkers, those who see the possibilities to acquire new K and C and to further develop their businesses, can also be restricted by barriers like lack of finances and time.

[81] Mid-North Tourism, the regional tourism organisation covering the counties of North Jutland and Viborg.

Another categorisation is the one of "frontrunners" and "followers"[82]. The "frontrunners" will typically look abroad and towards the competitors. The "followers" look towards the "frontrunners", their branch associations and regional tourism associations.

Depending on the operator, what is missing is very diverse, from technical skills to a broader understanding of tourism. According to the operators, these skills and competencies need to be developed further:

- Computer skills, i.e. construction of homepages
- Knowledge about making strategic business plans
- Marketing and promotion, written and visual
- Understanding of the market
- New visions/creativity

The informant from TGV emphasises that attending courses is not necessarily of main importance for the operators to upgrade their businesses. You either have the right attitude, interest and commitment or you do not.

> "Some people have a drive, and that is not about education. In this region (Western Jutland) there are many examples of this where being a good "merchant" is the most important factor for success. The good "merchants" are those who have the right stock of goods on the shelves at the right time". (Interview TGV)

The most important factor for success is the ability to be flexible and listen to what the market wants and being able to borrow money so it is possible to implement the ideas. According to a supporting agent, some of the operators have these characteristics, while others again have financial problems that prevent them from further development. Another group are those who are going to close their business in a few years time, and who therefore are not interested in further investment.

It is the common understanding among both the supporting agents and the firms that access to K&C in itself is not a problem. Although when it comes to more specialized courses or education, the larger cities are too far away from parts of the region, and one supporting agent mentions this as a problem. They thus experience the remoteness as a physical barrier to gain new knowledge.

Among the supporting agents, there is an expressed concern about the relatively low level of interest in attending courses, especially the actual attendance is low due to different barriers. One of the main reasons for this is obviously the size of the firms. In small firms, there is no extra time or a lack of time to participate. It is also a question of economy and the distance they are willing to travel to attend the courses. When operators actually attend courses, the supporting agents experience that there is a very strong commitment. It is reasonable to believe that a "push" in the right direction seems very much needed.

[82] "Frontrunners" is a characteristic of those that always are open for new ideas and are in constant development. Often "used" by the supporting agents to introduce new projects/activities/new ways of working and cooperating to "followers".

Box 2.4.1 web-turist.dk – homepage marketing

Nova Media is a part of a regional TV station in the midwestern part of Denmark. In 2003, the company offered a complete course package to upgrade the competence in the area of promotion via the Internet. This was done in co-operation with the regional tourism group, a multimedia company and with support from the EU Regional fund for Innovative actions. (The course is also offered on locations in Jutland, South and North and on Funen). The concept is new in Denmark when it comes to targeting the tourism industry specifically.

The target groups are the tourism operators and people working with the promotion of tourism in the region.

During the planning and the promotion of the course there was a great interest and demand for the product. Trying to get people to sign up was a little bit harder though, due to barriers like time and money for the small-scale operators. At the moment, there are about 45 participants in the course in the region, representing a very diverse group. The strength of the product according to the organizers is the way it leads the participants individually during constructing and developing the homepage to a promotional tool, presenting the attraction visually using video clips. Included is technical support at home and language assistance (translations). The main aim is to make the participants able to handle all parts of promotion via their homepages.

Educational institutions are not widely used when searching for new knowledge. The impression is that both the operators and the supporting agents feel that the distance between theory and what occurs in reality is too large. When supporting agents use educational institutions they are most likely to gain insights in macro trends and this information can be used when planning visions for the future.

The vocational education institutes contribute by producing and offering an educated work force. However, it does not seem like there is an active co-operation between firms involved in tourism and these kinds of educational institutes.

2.4.3 Innovation activity

As introduced in chapter 4.1.3, innovation within the service industry, including tourism, takes on another character than the processes we find within production industry. A study shows that tourism related firms are the least innovative among service firms when it comes to introducing new services/products[83]. On the other hand the innovations that are taking place in tourism are more original on average than the other firms represented in the survey. Tourism operators also suffer from organisational limitations when it comes to developing new services. The study also finds the limited size of the individual firms to be a barrier.

In our study, it is possible to find some similar aspects. The general impression of the supporting agents is that limited size to a certain level works as a barrier, and being short of time and finances can influence the ability to have the energy to engage in new development/innovative activities.

The operators mention to different degrees to be limited by either time or finances. This does not, however, imply that they are non-innovative; they have plenty of ideas and are engaged in activities[84]. In a majority of the firms, we find people with an "entrepreneurial spirit", meaning that their personnel involvement have the ability to "overshadow" fixed negative preconditions (to a certain point). This includes working long hours for "nothing" because

[83] Erhvervsministeriet (2000).

[84] See chapter 4.3.1

they are living out their dreams. One operator also emphasises the fact that they do not want to expand. By being a private and smaller firm instead of a larger independent institution, one can always be in control/make own decisions. In this operator's opinion, expanding can in "worst case" be a limitation of own (good) ideas.

Working in networks can be positive for some, since e.g. sharing expenses and being able to work "large scale" will be helpful in financial terms. They are also able to reach a larger market at the same expenses, and the possibilities for increasing the earnings are present. Still one has to consider the "negative effects" of networking and co-operation. Networking can also be time consuming and the feeling of not getting own ideas through can be frustrating. In most cases, there is a balance, and in the long term both partners are able to see that they benefit from it.

Box 2.4.2 Targeting a new consumer group-the Disability Project

An example of an innovative project on an international (European) level is the "Disability" project initiated by TGV (Tourist Group West Jutland). The project is innovative from the beginning and throughout the implementation, both when it comes to target group and products. It covers not only disability friendly accommodation, but also access to attractions and outdoor activities. The region's aim is to become the area in Europe where this special segment group goes on holiday. The overall motivation to target this group is to increase the region's income, the number of visitors regardless of season (school holidays) and increase the length of the season.

The supporting agents interfere typically at an early stage in the development process, according to themselves. Also, the common conception among the agents is that they and their institutions are the initiators of innovation. Some of the operators are seen as entrepreneurs that can be used as gate-openers to the remaining group.

According to one supporting agent, the problem is not really to involve the operators in new projects. When introducing a project from their side, a certain amount of financial support is usually involved. The problem evolves when the project is to develop independently from the supporting programmes and survive without the public financial support.

Box 2.4.3 A Regional Fund Objective 2 project surviving and expanding

"Træfpunkt"/"Meeting Places" is a family activity programme initiated with support from the EU programme Objective 2. Based on the ideas from the children clubs known from the charter travel industry, and adjusted to fit the conditions of the Danish coastal holiday.

Started in traditional coastal resort areas, and is now spreading outwards, also to less visited areas. An example of a project that survived the critical phase where the finances ceased to exist, and managed to expand in the period afterwards.

The supporting agent from the regional tourism organisation emphasizes the public sector as the actor that has the least problems with new ideas, contradictory to the image of the public sector as being very slow in adjusting to market changes. The agent claims that a natural reason for this is the degree of closeness to the industry. The public authorities are not depending on making profits, whereas for the operator it is a prerequisite to survive. This means that it is easier for them to join in on alternative ideas or have the energy to work with the idea.

Box 2.4.4 Culture voyages on the Limfjord and the North Sea

Public authorities as an initiator of exploring nature and culture in the northwestern part of Ringkoebing County.

In 2003, Ringkoebing County arranged a cultural festival "Mærk Vinden"(Feel the Wind). One of the events/attractions involved was the culture voyage with a sailing ship on the Limfjord and cutters on the North Sea. The project is being supported for 2 years. The project originates from North West Jutland Development Net, the local action group administrating the LEADER+ programme.

The main goal of the project is to build bridges between the promotion of nature /culture and the tourist industry, and in this way promote/develop tourism in the larger rural district.

The impression from TGV is that the activity level among the operators has risen. One of the reasons for this could be that the projects initiated have been successful.

> "If you create positive circles it is easier to get them (the operators) involved in upcoming projects. They can see that something actually comes out of it. Then it becomes easier and easier…it is all about trust and reliability…. and it takes years to build up these relations"
> (Interview TGV)

The main motivation for getting involved in new projects is the ability to gain from it financially:

> "It is necessary to have a "carrot", and it should preferably be one of the "golden" ones…. but there are not so many with sprinkles and sugar on here…"
> (Interview Viborg County).

Viborg County participates in the Mid-North tourism region. One destination company "Toppen af Danmark" is dominating, covering the County of Northern Jutland and thus representing the area that has the majority of the visitors. Participating in a co-operation where one destination is much more developed than the other has a positive influence on the region lagging behind.

The informant from Viborg County emphasizes the importance of learning and gaining a more diverse competence and knowledge base from the more experienced part.

We find that in views of the supporting agents the ideas of new projects develop as a result of the possibilities to receive public financial support. The Regional Funds, The Rural Development Programmes, and the EU based LEADER+ programme are to a large degree used as a source of inspiration.

> "The level of activity is very dependent on the financial possibilities. When the companies (attractions) reach a certain size (e.g. the Flowerpark Jesperhus), they constantly develop (and innovate). The same is visible at the larger holiday centres. Problems with being innovative are mostly found in the companies that have a critical size when it comes to their economy. There are many of those; the majority are very small companies. Are they active or not? The answer is both yes and no. The ones that have to survive on it, they have to realize that they have to be active". (Interview Viborg County)

A general feeling among the supporting agents is that operators are slow. However, it is though a form of "natural slowness", due to two main obstacles: lack of time and money. Expressions like this are not just aimed negatively and uniformly at the operators, but represent more of an acceptance of the general characteristics of the branch.

Examples of major products/projects represented in the region

Below is a presentation of some of the major activities in the region. There are representatives from both the supporting agents and the tourist operators.

- "Disability Project" (TGV). A total tourism product for the disabled, including adjusted accommodation, access to natural and cultural sights etc.
- "Træfpunkt" Meeting Point. Activities for children at all ages at different locations along the West Coast.
- "The Liquor Trail"- A product consisting of 9 public houses/pubs and 16 points of attractions/activities. Developed as a broad co-operation between public and private partners in the Limfjord Area (Network Limfjorden, counties, operators) The trail is offering accommodation, culinary experiences, liquor based on local seasoning/spice. This is combined with nature and cultural experiences, activities like golf, hiking, cycling and so on.
- "The Limfjord Cycle Route"
- "The Limjord Route-around the inlet in 80 different ways". Connecting different activities and locations around the inlet.
- "Nortrail, the North Sea Coastal Path", part of the INTERREG North Sea Programme. A project working with promoting sustainable cultural tourism through regenerating a number of walking trails along the North Sea Coast. Activities include development of information, services and infrastructure. Primary outcome; new networks.
- "National Park in Thy"- preparing a pilot project for a proposed national park
- "Mærk Vinden" (Feel the Wind). A cultural voyage at sea, arranged as sailing trips focusing on experiencing the locale nature/culture. Co-operation between public/private sectors.
- "Web Tourist". A complete Internet course for the tourism industry, provided by Nova Media education

Within the firms (tourist operators/intermediary firms) there is a variety of new activities/products mentioned:

- Recipe book for sale, "gentlemen's lunch", table of cakes.
- Expanding a kitchen to be able to have more guests, in the long run a B&B in connection to the establishment.
- A children's book with CD-ROM, about sheep/sheep herding/traditional craft
- Tourist sailing on Ringkoebing Fjord and charter trips on Limfjorden, package solutions. Some including food and local music.
- The "Barfuss Fahrt", a touch/feel experience of the local nature that consists of walking barefoot on a trail inside the Coastal Experience Centre in Thyboroen.
- A month long participation at a German travel fair, Hamburger Dom, participating with a 500 m^2 stand.

- Working with new target groups, including activities/attractions for young children and elderly people.
- "ThyWeb" a local homepage covering 25 villages and towns presenting news, culture activities etc. using a personal and local approach.
- Tourist newspapers.

We find that most of the innovations take the form of new products or services, but other forms of innovations are also present. For example, the network building between public and private partners, e.g. the "Liquor Trail", can also represent organisational innovation in addition to the trail being a product innovation.

Box 2.4.5 Inspiration from abroad adjusted to fit a coastal Danish product

A concept very much used in Germany in the attraction/leisure market is the "touch/feel /smell/taste"approach One specific product is the "Barfuss Fahrt", where the idea is walking on bare feet to feel different settings and environments.
The costal experience centre in Thyboroen adopted the product and introduced it 2004 as an indoor activity. Here you can walk through a variety of natural environments and get a sense of how it feels to walk on sand, in water, among crabs and seaweed etc.

One of the facilitating factors for innovation among the firms is that they have an extensive knowledge of the local environment. There is also creativity and a personal drive present, which are assets that will help many of the firms to survive.

The overall weakness of the product in parts of the region is, as emphasized by supporting agents, the relatively low level of quality. There is an increasing competition, both nationally and internationally, and to be able to fulfil the requirements from a more diverse, critical and demanding consumer group, there has to be a constant upgrading of the product on offer.

Box 2.4.6 Treasure hunt in Thy – getting to know the region via local quality products

In 2004, the local tourist association in Southern Thy created in co-operation with local artists the concept "The Dragon Egg - the hunt for the treasure". It takes the form of an illustrated book with stories, verses and poems that form the tasks. That is to stimulate all senses, and to find the treasure, a piece of jewellery produced by a local artist. The visitor is to be guided through the region while solving puzzles etc. The task typically takes a couple of days to complete while exploring the area.
The treasure hunt was the first of its kind when it started in June 2004. The hunt was completed in October 2004 where the winner was picked in a draw. The activity has been a success and will carry on the next season

2.4.4 Cooperation and networks

Networks represent for some of the informants a relatively constant group. Others have varying networks, e.g. ad hoc contacts for different projects. When describing the level of networking, one has to consider that there are different perceptions of what a network is, and how the network is used.

In general, this study shows that supporting agents all have extensive networks, while the firms are a more differentiated group. What sorts of activities the firms are operating with will also influence the level of diversity in the networks. It is possible to see, however, that the most active or innovative respondents have more contacts than those that have a lower activity level.

Among the firms, both operators and intermediary firms, there are two groups of co-operation partners that are distinguishable. The majority mention the public regulatory authorities and neighbours/personal networks as partners they are in regular contact with. Interest groups and public sphere movements are also mentioned as important for some of the firms. The connection that is least visible is the one with the R/D (research and development) sector.

The firms form extensive local networks, with municipalities, local business groups and more personal networks. In a small municipality, networking take the form of an everyday life contact. The director of one of the firms is also the chairman for the local business and tourist organisation and obviously has a very wide network.

Firms that engage in activities that are not so common in the region depend on national/international networks. These are often professional networks and are typically used for catching up with the latest news within the particular sector and to seek help and information when experiencing problems with daily operations. As an example, the privately owned aquarium in Thyboroen uses contacts at the national Zoo or other aquariums nationwide. In these entities, they have a more specific expertise, like marine biologist. Likewise, there is a formal contact network between the aquariums in Scandinavia.

One firm uses actively the personal and professional contacts and networks from their life before starting in the tourism industry. These contacts were used from the beginning, where research and seeking information was done in another region of the country, and it is also used introducing new activities in the firm at present.

Since the supporting agents have extensive networks and many being specifically to individual projects (ad hoc basis), it was difficult to list and categorise different partners and the frequency of the interaction, and also to differentiate between formal and non-formal contacts. Most agents operate locally, regionally and nationally. This is the case for the counties and the regional tourism organisation, which also have international partners for individual projects (e.g. Viborg and Ringkoebing County participating in INTERREG North Sea Programme, the North Sea Coastal Path, Nave Nortrail).

Similar to what we find among the firms, there is no relevant connection between the supporting agents and commercial labs and R&D enterprises. This pattern is expected since R&D in general is not relevant for the sector. We find that the supporting agents to a certain extent cooperate with universities. This is typically used to gain ideas and inspiration. One example is when the regional tourism organisation uses research from Aalborg University that concerns the German family holiday makers, motivations, perceptions and views on Denmark as a holiday destination. By gaining knowledge about the latest analysis and trends, they can identify which niches one should concentrate on in different regions.

There is also a strong connection *between* the supporting agents in this study. An example is the co-operation between the regional tourism organisations and the counties, which can be characterised as a close synergetic relationship. The regional tourism companies are responsible for marketing the region and developing the product basis, while the counties are responsible for the more general developmental approach to the industry, related e.g. to competence building and infrastructure. The establishment of the regional tourism companies in 1996 was also a means of doing something with the fragmentation of Danish tourism and they provide a structure for increasing the level of co-operation.

Partners in the future

In most cases, the interviewees emphasised the already existing networks, and improving those relations instead of mentioning new partners. This is natural since many already have a wide network.

The informant from Nova Media sees the business opportunities in working with the Danish Tourist board:

> "We have to cooperate with the industry since they have the contacts. There will be an increasing focus on the Internet. The consumer (tourists) approaches the product directly, without many intermediary actors. Because of this it is very important that the product/the service from the operator is of a good quality." (Interview Nova Media)

The regional tourism organisation, TGV, emphasizes the public sector, in this case the municipalities and the counties as very relevant partners for future innovation activities. Here, synergy effects are expected in that the public sector has a different form of knowledge and canals for influence than the private sector. Since this sector obviously has a major influence on planning in general and on the use of natural resources in particular, it is already a key partner, but the partnership is seen as very valuable and can with advantage be exploited further. The co-operation seems to be beneficial for both partners. There are examples that illustrate the rewarding and profitable relationship between public authorities (the counties) and the regional tourism organisations. It shows how it evolves into new networks and products based on local and "unknown" resources that later can survive and generate new tourism products.

Box 2.4.7 Network Limfjorden, developing a product based on authentic and local culture/nature

Network Limfjorden, a supported co-operation introduced in the 1990s, aiming towards developing a common marketing strategy for the Limfjord area, from Hals to Harborøre.
The three Limfjord counties Viborg, North Jutland and Ringkoebing are involved, as well as two regional tourism organisations, The Tourist Group West Jutland and Mid-North Tourism, the latter being responsible for the secretary function. Other partners are municipalities, local tourist bureaus and destination companies.
Pilot project: "Snapseruten" (The Liquor Trail) was developed by the network and introduced in 1998. Since then, it has experienced a solid success. "Snapseruten" became an independent organisation in 2004.
A new project for the network is "Around the Limfjord in 80 ways", which was introduced in 2004, and the main effort is to be initiated in 2005. The project is developed around a common plan for product development and marketing in the area. The aim is to place the relatively unexplored area on the Danish tourism map.

Another example of "good practice" when it comes to networking is what we find in 4 municipalities defined as a LEADER+ area in Ringkoebing County. The network set up is an example of how working in a public/private partnership gives positive effects on tourism.

Research shows that co-operation with other firms and other actors promotes the level of innovation activity[85]. A survey shows that the majority of those that can be characterised as innovative take part in permanent alliances, where the opposite is the case for the firms that have a limited innovation degree[86]. Due to the limited selection in our case study and also the

[85] Jensen et al. (2001).

[86] Erhvervsministeriet (2000).

fact that some firms are atypical, it is not possible to confirm this. It is of relevance, however, to mention that it has an influence on the activity level when the operators themselves are actively involved in their surroundings.

2.4.5 Innovation conditions

The awareness of the system is obviously high among the supporting agents, especially in the case of the public authorities, but also at the regional tourism association and the local destination company. Since this is very much a part of their work, they are aware of the policies. More important seems to be the knowledge of the different rural support programmes. Programmes like the Regional Fund Objective 2, LEADER+ and the Rural District Programme Article 33 are widely mentioned, both by the supporting agents and the operators. As expressed by one supporting agent, *"These programmes are earmarked for these purposes (development in rural areas) and they are also usable in "the real world"*. (Interview TGV)

A typical barrier in the external environment is the low level or the lack of funding in the tourism industry. Businesses suffer from the image of the sector as low status and find it hard to acclaim sufficient financial support, which again makes it difficult to make investments on a long-term basis. One a national level, the State supports tourism by funding the national tourist board that is responsible for marketing Denmark as a tourist destination in general. This will not necessarily affect the peripheral areas, according to one supporting agent:

> "Tourism is one of the few growth areas in peripheral areas, where there is a potential. Peripheral areas are typically found along the coast. Who does one give the money to? To the Danish Tourist board that is responsible for tourism nationally and to Copenhagen (the capital region). If you *really* want to do something for the peripheral areas and the development of tourism, it is not enough with small funds of 5 millions yearly. There is a need for large-scale investments, to make the product less reliable of main season and climate. The Danish Tourist board has a duty to promote Denmark in general, and this does not necessarily create growth in the peripheral areas. It is rather far from it". (Interview TGV)

In more general terms, one of the intermediary agents finds that there is a lack of support possibilities for private firms. They characterise it as very negative that the state support for establishers/entrepreneurs has ceased to exist. For the company in question, it has been hard to convince the financial institutes that there is value in their activities, in this case IT.

The challenges that owners and managers want to work with in the future are typically concrete and financial. However, visions for the longer run also seem important. Some of the operators find it very hard to exist despite their positive visions for the future, because the day-to-day problems take up too much of the time. Supporting agents recognise this pattern, e.g. when working with the operators and introducing a new project. It can be a very time consuming process to convince the operators to invest their time and resources in something that does not give an effect in the short term. Tourism is an industry with low status, and the financial situations for the firms are tight. In some circumstances, one supporting agent feels that they really need to put pressure on the operators to engage in new projects, "follow" them through, and make it as convenient as possible and if possible help with the funding.

When working with introducing new projects, one has to take into consideration the general slackness. Another characteristic is that the many partners that are typically involved when it comes to larger projects are on various levels. Instead of waiting for the entire group to catch up, one begins with those who are already "up front" and ready for new ideas, "frontrunners". The "frontrunners" stand out as good examples (positive role model). The supporting agent is deliberately using these operators to facilitate development among those that are lagging behind.

One of the firms mentions the local environment to be restrictive in some ways, especially for newcomers. It can be hard to co-operate and become accepted in the local society due to some being envious. This does not represent the majority though.

The supporting agents themselves are very active and are helpful in creating support systems for the individual firms. One of their tasks is to inform individual firms about the possibilities found in the support programmes. There are several examples in the region of projects that have evolved from these support programmes and that will be able to survive on its own afterwards[87]. They are often built on public/private partnerships, a relationship that seems to be favourable for making projects viable.

Working in networks across sectoral borders seems to have had a very positive effect. Both Network Limfjorden and North West Development Networks have created new projects that are economically sustainable. Creating an environment for co-operation and combining areas that traditionally have not been working together has given results in forms of small-scale activities operating on a larger scale.

In more general terms, when talking about tourism development, the discussion about the increased amount of leisure time in the population is mentioned. Those operating on the West Coast have noticed over the last years an increase in (Danish) families on the "third" vacation, especially from East Denmark and Zeeland. This has been more visible since the bridges between the regions were established.

Generally speaking, both the operators themselves and the supporting agents indicate money (earnings) as the most common factor of motivation for getting involved in new project. But also the more "developmental" approach is visible. One operator mentions that attracting more tourists to the village was the overall objective for getting engaged in a sailing project. The possibility for actually being able to witness changes and new (positive) developments in their local area is a great motivation for many.

The general attitude towards innovation and entrepreneurship in the region is overall positive, although there is a certain level of slackness. Whereas the majority of the supporting agents find that this tendency has a negative influence, one finds that this is just another factor that has to be taken into consideration when working with this sector.

Parts of the study area have traditionally had a high proportion of the population engaged as fishermen and farmers, so there is a distinct independency business culture. One operator emphasises that there are many people in the local area that are very interested in starting for

[87] For example, "Meeting Places", a family activity programme receiving support from Regional Fund Objective 2 support programme, and "Feel the Wind" and "Small Food Producers Network", receiving funds from LEADER+.

themselves, and many are real entrepreneurs, coming up with new ideas. The local trade and industry director plays an important part in backing up the entrepreneurs. Local culture and a good public support system thus have a major influence on the ability and desire to be innovative.

When summarising the case study of tourism, there are some identifiable factors that seems to influence the innovative capacity of the tourism industry in peripheral areas:

- Coordinative networks
- Sufficient funding and support
- Upgrading of quality
- Knowledge of market

This can make possible a product based on unique local characteristics, and thereby integrate the element of authenticity that is documented to be in demand. The importance of high quality products is vital. By working together, a number of small scale products can go "large" and in the long term become more economically viable. Knowing the market will be helpful in establishing a niche and increasing the ability to reach the proper customers.

2.5 Findings from the study on the furniture industry

2.5.1 Background information

10 have been interviewed: 6 companies and 4 local support agents to the sector in the area of Salling-Mors in Viborg County.

The chosen companies in the furniture manufacturing case sector have been selected so as to be locally owned and operated and together to have reference to the sectors as a whole as a typical and well-representative sample of the different types of well-established companies in the area of Salling-Mors, which all together are known as the Salling furniture cluster. The varied group of furniture and wood companies chosen represent different types of main products and display diverse competition and innovation strategies according to this. They are locally anchored medium and large companies operating in highly competitive international markets.

The support agents selected represent different major players for the furniture sector in the area. The group includes the educational sector, a non-profit consultancy and network centre for the sector, a local development agency and a local employers' association (cabinet maker guild) for the sector, see Appendix 2 for description of interviewees.

2.5.2 Knowledge and competence base

Like the educational profile of the workforce in the area of Viborg and Ringkoebing counties, the employees of the companies in question are for the majority formally unskilled, though highly experienced via long-lasting employment relations within the sector and the company and the obtained on-the-job-training. The companies express that generally the workforce is well motivated and flexible concerning implementation of changes in production.

For many years, the technical school and business academy of the area has been the leading institution for formal education of workers within the wood and furniture industry. The school has students from all over Denmark and during the years, many have stayed in the area either as independent entrepreneurs or as employees in the existing furniture cluster of companies. In this sense, the knowledge and competence base of the furniture and wood sector in the area is outstanding in a national comparison.

The companies are generally active in sustaining and expanding the knowledge and competence base. They take an interest in the education of new generations of cabinetmakers and give space for apprenticeships etc. They are also all positive towards the local technical school and activities created for the business centre.

There has not been registered any laboratories or research or design departments etc. in connection with the companies or the sector in general, though employees are working with design issues as well as adaptation of products and processes on a continual basis. The technical school has offered "open workshop" for company employees (on a voluntary basis), but with little success in terms of participation.

New initiatives on knowledge and competence building have been taken on design strategies and knowledge-building in manufacturing and education. "Innovator**"** is a 2-year study programme with specializations in design/product development, trend/marketing and process/logistics, respectively, and is for students at high-school level of education.

"Innovation-designer" is a 1½-year course programme with modules in the idea phase, the constructions phase and the pre-production phase of innovation for employees in the furniture industry with some years of experience. Participants in these initiatives at Skive Technical School/Business Academy Mid-West are the Development Centre for Furniture and Wood, Wood Manufacturers Employers Union and private companies in the area. The initiatives build on resources and external support from Viborg County, Ministry of Business and Housing, Technological Institute, Århus School of Architecture and Design all together with private technical and business consultants. The education projects are all new initiatives with the aim of enhancing the knowledge base in the sector in the region and are carried out in collaboration with/participation of local furniture manufacturers.

Another type of example of recent development of the employee competences is found in the Bodilsen furniture company, see Box 2.5.1.

Box 2.5.1 Knowing Bodilsen

"Bliv klog på Bodilsen" ("Knowing Bodilsen") – a course project for all company employees running 2003-2004 and 2005 (2 groups of 18/week) with replacement by unemployed unskilled workers in the area. The course focus is on delegation, flexibility, working in teams and new wage systems.
The employee-education project is done in collaboration with Nordvestjysk Handelsgymnasium (Business Academy Mid-West), Nykøbing Mors, The company invests app. DKK 6 million in the project.

From a company viewpoint, needs for new knowledge and competences go in the direction of marketing and market trends internationally. One company also mentions language skills as a weak point. No one expresses needs for knowledge or competences in materials or technologies, though the pine wood specialised manufacturers have an interest in knowledge about new materials and other types of wood. Design knowledge and skills are also in high value, though there is not found any expressions of direct needs in this regard. The support agent point of view is all together in good accordance with this impression. The companies seem to be very efficient in technological terms and more vulnerable concerning information on consumer trends and fashion, why an upgrading of design competences is regarded as a viable strategy for the sector.

Quite similar, the question of barriers for access to knowledge is answered negative. The companies use the technical information service system, the schools and professional networks, journals and fairs etc. as sources for information and knowledge. The relatively low level of management staff with higher education may explain the low interaction and use of research institutes and universities in this regard, which have been recorded.

2.5.3 Innovation activity

Among the companies of the furniture cluster in question, innovation appears continuously and in all dimensions of product development, process development and organizational change and new markets. The companies are very active, though they follow different competitive strategies and, hence, engage in different innovation processes. Some of the larger companies have hundreds of different products and variants to be combined in numerous ways and are constantly renewing this inventory according to market trends.

We find process innovations in the very classical sense of investment in new production equipment to increase production capacity to meet price competition on standardized

bedroom furniture, investment leading to productivity growth e.g. via project groups on bottlenecks on the materials flow and implementation of ISO 9001 securing standardized quality and reducing waste products. The companies all work for cost reductions via robotics, teamwork, outsourcing of tasks and changing the suppliers of the wood. See Box 2.5.2. for a successful example.

Box 2.5.2 "Baltic Supplier-building" - The annual Skive Cabinet Makers Guild Tour
"Balticum Suppliers-building" – The annual Skive Cabinet Makers Guild Tour

One of the member activities of the guild organisation is a joint tour abroad to visit foreign companies in machinery, wood and finished furniture, furniture fairs and exhibitions etc. It works as a mix of a social event and a professional network activity.

10 years ago, the trip went to the Baltic countries and it resulted in making commercial contacts and establishment of supplier relations in the Baltics on wood and furniture prefabrications for several of the Salling furniture cluster companies.

The Ingabo furniture company in Oddense have used these supplier relations in a restructuring of the enterprise from a large manufacturing company to a sales company with minor activities in fabrication and design. Ingabo has in this way taken a lead in outsourcing of the manufacturing activities and hereby stayed competitive in the market after a reconstruction in 2002.

Innovation processes seem to develop in 2 ways, either in interaction with clients and customers, who place an order at the company after negotiation of designs etc. or the company engage with professional furniture designers to develop a new piece of furniture or collection of furniture, which is then promoted and marketed – sometimes internationally via national export promotion activities, trade representations abroad etc.

In both ways of generating product (and the accompanied process) innovations, you can succeed or fail. You may in the first instance miss the specifications and quality required by a fixed client or you might miss the taste of the final consumer. All companies report on product failures and losses as a normal part of the business. With high quality designer furniture you may have a longer time horizon and smaller production volume, while the cheaper mass-produced furniture has a lower tolerance in these respects.

Innovation parameters are price, fashion (designs, surfaces and colours, materials), collections of furniture components, functionality of furniture, quality and durability. Quality and durability can be developed and communicated via a voluntary control system and a quality control label for furniture, see Box 2.5.3.

Box 2.5.3 Magnus Olesen and Danish Furniture Quality Control

The Danish Furniture-makers' Quality Control was established in 1959 with the aim to work for the manufacturing of high quality furniture in Denmark and is the world's first control organization for furniture. The members (26 by mid-2004) are manufacturers of high quality furniture. Magnus Olesen was among the founders and the company is today still a leading member of the organization.
High quality is ensured through factory control visits combined with a set of requirements on materials, production methods, and products, the "Technical Specifications" in accordance with – and disseminated into - European Standards (EN standards) for furniture.
Factory control visits at the member factories are carried out at least twice per year (in 2003, 3 times) by leading Danish experts in furniture materials, furniture manufacturing and product requirements and testing, experts within wood and wood based materials, plastics, metals, furniture production methods, glues, surface finishes, furniture testing, CE-labelling, GS-labelling and environmental requirements.
The experts do not only act as "controllers" but also as advisers for the members, thus encouraging and helping the member companies with new materials, new manufacturing methods, trouble shooting etc.
www.dansk-mobelkontrol.dk

The companies in the case have not indicated less-tangible qualities like environmental profile, social and ethical aspects of production etc. or services, product guarantees, delivery time and other ”external” logistics or marketing issues as important innovation parameters. Some of these may be considered as a natural part of the business to consider in production and product development. One company finds environmentally friendly paints and lacquers in conflict with demands for high durability. Another assumes sustainable grown hardwood (and seals) as a commonplace but without much real value due to lack of international control of the suppliers.

The wood trader company has together with the Danish Union of Wood Traders (TUN) implemented a project on a standardized open electronic information system for wood and building materials (“Byggebasen”), which should have made it easier for the suppliers to deliver the demanded items, especially to the construction sector.

With regard to product innovation activities, all companies express, that they in the future will continue along the same lines of high development activity. Some express an interest in new wood sorts and materials. Regarding process innovation, several companies express an interest in outsourcing parts of production to the East-European countries and South-East Asia and China as a way to lower labour costs, while others invest in increased production capacity and/or optimization of existing facilities, internal logistics and employee training and education.

It is clear that new generations of educated people within the sector will add new innovation potentials to the sector. To the supply of embodied knowledge and competences can also be added new innovation facilitating initiatives such as fairs and competitions, see Box 2.5.4.

Box 2.5.4 ”Furniture Cup” – Centre for Development of Furniture and Wood, Skive

An annual competition among furniture manufacturers on new furniture and product innovation with integrated innovation education programme for participant teams. For manufacturing firms who take part and/or sponsor consortia of developers.

2.5.4 Cooperation and networks

The co-operation arrangements and utilization of services provided by company-external parties and support agents in relation to implementing novelties and innovation activities have been recorded according to a common typology of innovation systems research[88]. In the furniture case, it must be noted that the answers given by the company representatives gives a systematic bias because of a common tendency to answer strategically to questions on this aspect of innovation. This means that the collaboration partners indicated by the companies should be regarded as a minimum of the formal and informal contacts and partnerships actually in place and use for innovation. It is, furthermore, difficult to clearly separate collaborative relations in general from special relations with regard to a specific innovation project.

Clients and customers are together with suppliers of equipment, materials, components and software the 2 dominant types of collaboration partners with regard to implementation of innovations. Almost all companies in the furniture case use both groups. Relations with customers are more regular via meetings and communication with agents and sales representatives, while suppliers are used on a case-by-case basis depending on tasks and problems arising in the innovation process. Relations with customers are considered most important in general, but are mostly indirect. It is customer representatives, sales agents and clients, market analysts etc., who transmit and communicate on consumer preferences, taste and fashion etc. The companies also try themselves to interpret customer needs and preferences via visits abroad to furniture exhibitions and fairs. They also exhibit new designs and collections themselves at international furniture fairs (Italy, Germany, Denmark).

There has here been a clear division of the companies into “in house” designer furniture manufacturers (contracted designers) and furniture suppliers to large retailers with their own design specifications. The borders are today disappearing and the furniture suppliers are taken interest and experimenting more with designs themselves.

The second most important external partners in innovation are educational institutions and public regulatory authorities, in this case the technical school and business academy and the municipalities and county, respectively. They are involved in different aspects of training and transmitting new knowledge in general in the education case and taking part in different aspects of approval and control of production facilities and applications for funds etc. While the relations to the technical schools are on a regular basis with student exchange and training, the relation with the public authorities are on a case-by-case basis in relation with specific project activities. Relations are both formal and informal in all cases.

Students at the Skive technical school not only collaborate on process and product design projects with local companies, but also have started to put design projects at display at the Danish furniture fair in Copenhagen. Here, there is a dilemma between personally motivated interests and formal incentives for the employees of the public educational sector in relation with participation in development activities and innovation networks. The present salary system leaves no room for engagements in international networking and development activities.

[88] Lindegaard (1997).

Other collaborative relations in connection with innovation activities the last couple of years have been to industry associations and/or professional networks, development agencies, Government or private non-profit research institutes, competitors and other firms from the same industry sector, parent company or other enterprises within the enterprise group. See Appendix 1, Table A1.5.

The companies have indicated, that their preference for partners for future innovation activities are the same as they know now, which could be a signal of a barriers for co-operation and a lack of sources of information in the direction of unknown partners and types of support agents.

Concerning the collaboration partners for the support agents themselves, we here have strategic answers that may provide us with a maximum indication of partners involved in collaborative activities in some cases. See Appendix 1, Table A1.6. The mapping gives ideas of collaborative patterns and resource agents in the sector. It must be noted, that the support agents included in the study in no way constitute the complete group of relevant and important agents for the companies and the sector.

2.5.5 Innovation Conditions

Regional and national policy and the current public support services are not playing any important role for the development activities of the companies in question. Instead, they find the county council very active in business development services and several companies have made use of some public support schemes either via the county and the European Union schemes or via national support schemes for e.g. disadvantages groups on the labour market. Some companies would like a scheme of tax reduction for research and development expenditures introduced in Danish government policy.

As a facilitating factor for innovation (external environment of the companies), the "Udviklingscenter for møbler og træ" in Skive (Development Centre for Furniture and Wood) is a good example of a recent initiative to enhance and promote innovation in the furniture sector. It was established with the aim of strengthening the collaboration with knowledge and educational institutions and to raise the competences and level of education of the companies in the sector through improved education, courses etc. Participants in the centre include Skive Technical School/Business Academy Mid-West, Danish Technological Institute, Technological Information Centre/Business Centre Viborg, Viborg County. The centre is supported by the Danish "Regional Growth Environments" policy initiative, which is new in the combined focus on knowledge dissemination and education, on building on existing competences and specialisations in a geographical area and in the ambition to help build long lasting relations between knowledge and education institutions and the private sector.

The perception of and general attitudes towards innovation and entrepreneurship in the local area is regarded as very positive. This can be explained by a long cultural tradition in the region of entrepreneurship and craftsmanship.[89] The Salling Development Council is explicitly addressing these issues in its activities. Though the localised learning and trust

[89] Lorenzen (1998) and Maskell (1998).

among the companies of the Salling furniture cluster may not be what it was in the 1990´s period of growth and expansion, the entrepreneurial spirit seems intact today, where we see a concentration in the sector and a division of strategies and markets, not collaboration and sub-contracting locally.

2.6 Conclusions

With the *ISP* project (*Innovation Systems and the Periphery*), focus and methods are directed towards marginal areas to look for innovation systems, their well being and functioning in traditional sectors far from university cities and so-called high-technology with a view to examining the needs and possibilities for enhancement of applicable knowledge and competences and thereby the business environment for innovation in the periphery.

2.6.1 Collaboration on product innovation

There are, of course, a big variety of examples of business development – also in peripheral areas. In the case studies we have also found good examples of innovation and business development by peripherally located companies and their collaborative networks.

The chosen companies in the 3 case sectors have been selected so as to be locally owned and operated and together to have reference to the sectors as a whole, either as atypical or typical for the area.

- In the agri-food industry, the diverse group of small and medium sized companies includes companies with successful product development within sub-sectors dominated by a single international company as well as a daughter company and a small exporter. Together they are representative types of locally anchored food processing companies in the peripheral region.
- In the tourism sector, the diverse group of micro and small companies includes operators of new types of service products in a market dominated by one single type of tourist industry, the west-coast summerhouse accommodation services. The chosen companies represent all together alternative and complementary product types and are locally anchored in the peripheral region.
- In the furniture industry, the varied group of case companies chosen represent different types of products and display diverse competition and innovation strategies according to this. They are locally anchored medium and large companies operating in highly competitive international markets.

The Danish ISP study shows that Danish companies in peripheral areas in various ways find relevant knowledge and competence for innovation and development of new products. They find it together with actors that are both geographically close and distant.

Market relations with suppliers and customers are the most frequently used channels for collaboration on innovation projects across all sectors. In addition, we find that institutional sources are frequently used both in the tourism and food sector. Different types of support agents and actors play a varied role from one sector to another and for one company to the other, within a sector as well. There are similarities as well within and across the sectors. Some types of support agents are not or very seldom involved in collaborative projects of the companies studied. This may partly be due to the physical characteristics of the marginal area in terms of distance to larger cities and infrastructure in a broad sense. It may also be due to

common characteristics of sectors and the business community as a whole in terms of culture, tradition and competencies. See Table 14 for a general overview.

Table 14. Innovation and collaboration- a profile of 3 case sectors in the Viborg-Ringkoebing region of Denmark

Agri-food case Small and medium-sized enterprises	**Tourism case** Micro and small enterprises	**Furniture case** Small and medium sized and larger enterprises
Innovation strategies: Products, processes, markets **Participants:** Suppliers (knowledge intensive agricultural sector), customers and support agents (universities/education, non-profit research, commercial laboratories/R&D enterprises, public regulatory authorities, business consultants, industry associations and/or professional networks, interest groups and/or public sphere movements, financial institutions-/actors, neighbours or other personal networks **Knowledge and competencies:** Practical skills and handicraft, raw materials, process technology, markets, flexibility **Markets:** Local-regional and national **Geography of innovation system:** Local, regional-national (international).	**Innovation strategies:** Products, processes, markets **Participants:** Suppliers, customers and support agents (universities or education, public regulatory authorities, business consultants/experts, industry associations and/or professional networks, interest groups and/or public sphere movements, financial institutions/actors, neighbours or other personal networks) **Knowledge and competencies:** Local knowledge and practical skills, culture, nature, language, coordination **Markets:** National, international **Geography of innovation system:** Local, regional, (national-international).	**Innovation strategies:** Products, processes, markets **Participants:** Suppliers and customers and support agents (education, non-profit research, public regulatory authorities, industry associations/professional networks) **Knowledge and competencies:** Practical skills and handicraft, process technology, markets, design **Markets:** International **Geography of innovation system:** Regional, national, international

Based on interviews with 10-15 enterprises and support agents from each sector in the period June-September 2004.

Among the local actors, it is possible to count customers and suppliers of the companies, but the location of the most important markets seems to determine the geography of collaboration on innovation, especially in the furniture and food sectors. The export oriented companies like the furniture manufacturers are mostly orientated towards close foreign markets in Germany and UK with supplies from Finland, Sweden, the Baltic countries, Germany and Italy. The food processing companies have local-regional and national markets, with influence on who are the main drivers of their innovation and development. In the tourism sector, we find a different pattern, where the support agents or supportive schemes enhance many innovative activities and developments. The market is national/international whereas the collaborations the operators typically engage in are on the regional level.

Other more local and regional determined collaborations focus on education, business services, marketing as well as technical aspects of product development and production processes. Public authorities – locally and regionally (and nationally) – are also mentioned as collaborative partners in connection with specific innovation projects. This interaction between the development actors provides a local-regional basis for innovation systems' development of knowledge and competences.

Agri-food industry

We find a highly developed food industry in Denmark but moving away from rural areas. Globalization, outsourcing and new "high tech" technology development is not benefiting the rural and peripheral areas in terms of jobs and income generation. There are big differences between large and small actors. Small actors have a difficult time staying in the market with lack of resources for innovation: Funding, competences (management, marketing), and distribution.

Innovation systems around the agri-food industry in the periphery

Company specific: Market suppliers, Customers, Companies, and Neighbours within a geography varying from local to regional, national (international).

Sector specific: Education, R&D, Universities within a geography varying from regional to national.

Study area: Authorities, Technical Information Centres/Business Centres, "Regional Growth Environment"

Tourism industry

Tourism can be viewed as a problem sector due to it being a last resort for many of the entrepreneurs with low wages, seasonal work, no generation of qualifications. The challenge is to raise the level of complexity and increase the product value.

In product development it can be important for the sector to keep the traditions and emphasize the uniqueness of the Danish product in the development and marketing of tourism as well as to strike a balance between mass-tourism and the environment.

Innovation systems of local tourism operators in the periphery

Company specific: Customers, Companies, Support agents within a geography varying from local, regional, national to international.

Sector specific: Education, Business Associations within a geography varying from regional to national.

Study area: Development agencies, Authorities

Furniture industry

The sector is facing increased competition from furniture producers abroad, especially in Eastern Europe, relatively low research and innovation rates and few new products ready for marketing, limited use of the competencies of the workforce and relatively weak level of education of management. The industry lacks resources for innovation, especially funds and competences in design and marketing etc.

Innovation systems of local furniture producers in the periphery

Company specific: Market suppliers, Customers, Companies within a geography varying from regional to international

Sector specific: Education, "Growth Environment" centre, R&D, Industry Associations within a geography varying from regional to national

Study area: Technical Information Centres/Business Centres, Development Council, "Regional Growth Environment".

2.6.2 Lessons for policy

Some general policy recommendations across the sectors can be made. Generally we find few collaborations with educational and research institutions on innovation because of the weak presence of these institutions in the peripheral area, the traditional low-tech sectors without tradition for research and few formally educated employees, and low education/research interest/abilities and funds.

- The very well experienced and practically skilled (though low formally educated) workforce in the sectors and areas is an important asset for the companies. There is a need for experimentation with new learning methods in the educational sector in order to capture and build on the competences.
- A stronger focus on the incentive and support system for innovation activities in firms (tax reduction, financial support, soft loans, etc.) also seems to be needed, especially for the small (and micro) companies.
- Also, more communication and a dialogue-based bottom-up approach to policy initiatives will benefit the outcomes and results of the company development activities.

The Danish "Regional Growth Environment" initiative is an example of a bottom-up approach. This is set up by local actors that can agree on establishing collaboration with local support and funding and then apply for government funding, aiming at supporting knowledge dissemination and education activities targeting innovation within a specific sector. The initiative, however, is also an example of the dominant way of thinking in business development, where initiatives are confined to a single sector, a so-called "strength position" clustering in an area. This may leave companies and knowledge institutions of the same sector in other parts of the country out because of physical distance etc. Another problem can also turn out to be the segmentation of competence building and innovation within the limits and among the well-established actors of existing sectors, thereby leaving actors and ideas from other sectors out. Even if we e.g. have found examples of tourism innovation initiatives related to farming activities, the general trend as also found in our study may be a warning – and a challenge for both tourism and agriculture to join each other in innovation.

- The lock-in into sectoral thinking, raises a need for a complementary territorial approach to cross-sectoral interaction and co-operation: Locally and regionally coordinated cross-sectoral innovation support policy supported by local innovation facilitators connecting local firms with knowledge producers in and outside the region.
- Support to the support agents, who display many external relations with each other within each sector, while the cross-sectoral communication and interaction seems

weak and underexploited (see Appendix 1, Tables A1.2, A1.4, and A1.6). There is also a need for support-to-support agents to link better into and out of the region.

We have also recorded disparities between companies' and supportive agents' perception of knowledge and competence needs and support programmes etc. Missing business opportunities and innovation options in the sectors can be the result.

The innovative companies themselves are in different degrees able to make use of national and international partners. It is a good question, whether this is determined solely by the location of the most important markets for the companies, whether it is determined by their role as supplier or contractors with limited control over their network engagements or whether it is caused by weaknesses in the geographically close knowledge networks, which the companies seek compensation for with more distant actors. We may at the same time ask: Are the Danish companies in peripheral areas able to use their local knowledge and networks to an extent and in ways that can have international impacts e.g. on the sales of their products on foreign markets? The problems and possible solutions may be found both among the companies and among the support agents of the innovation systems in the periphery.

Innovation policy focuses on strengthening the framework conditions for business competitiveness and innovation. In regional and rural development policies for business development the focus on innovation will play a larger and larger role. This will influence the future education of the work force and the internal dynamics of the companies as well as the external framework and knowledge networks, which can inspire and support development activities – and select among the good ideas.

2.7 Summary

The Danish ISP study shows that Danish companies of the traditional sectors of agri-food, furniture and tourism in peripheral areas find and utilize relevant knowledge and competences for innovation and development of new products in networks with both geographically close and distant actors.

- In the agri-food industry, a diverse group of selected small and medium-sized companies includes companies with successful product development within sub-sectors dominated by a single international company as well as a daughter company and a small exporter. Together they are representative types of locally anchored agri-food industry in the peripheral region. In contrast to the general trend in the sector, we find lively independent and innovative companies.
- In the tourism sector, a diverse group of micro and small companies includes operators of new types of service products in a market dominated by one single type of tourist industry, the west-coast summerhouse accommodation services. The companies represent all together alternative and complementary product types and are locally anchored in the peripheral region. In contrast to the general picture of the sector, we find new and innovative small operators working together to up-grade their products.
- In the furniture industry, a varied group of selected companies represent different types of products and display diverse competition and innovation strategies according to this. They are locally anchored medium and large companies operating in highly competitive international markets. Contrary to the general picture of the sector, we find highly innovative companies experimenting with design and new markets.
- In the furniture industry, market relations with suppliers and customers are the most frequently used channels for collaboration on innovation projects across companies. These channels are also used in the other case sectors, but to a lesser extent. Different types of support agents and actors play a role varying from one company to the other within the sectors. There are similarities as well within and across the sectors. Public authorities and technological and business service providers – locally and regionally – are also working as collaborative partners in connection with specific innovation projects. This interaction provides a local-regional basis for innovation systems' development of knowledge and competences.
- Across all sectors, we find a lot of potential in the use of the competences of the workforce and upgrading the relatively weak level of (formal) education of the employees – including the management. We also find an explicit need for support to the funding of innovation and research and development activities, especially among the smaller companies. We find, furthermore, a need for support to the support agents themselves, in order to enhance their own room for development and their knowledge and competence-building activities in the region.
- Several types of possible support agents are not or very seldom involved in collaborative projects by the companies studied. This may partly be due to the physical characteristics of the marginal area in terms of distance to larger cities and infrastructure in a broad sense. It may also be due to common characteristics of whole sectors and the business

community as a whole in terms of culture, tradition and competencies, which acts as barriers for collaboration and knowledge-building with untraditional innovation partners.

- Concerning policy conclusions, the Danish ISP study points towards a stronger emphasis on the "Regional Growth Environment" initiative of competence-building, but with a local-regional perspective added rather than a sector-specific, in order to enhance cross-sector interaction and innovation in the peripheral areas.
- It is also important to strengthen the educational sector and link vocational training and education stronger to research environments and technological institutes etc. as well as closer to the business sector of a region in order to develop relevant and attractive activities for the well-experienced but formally low educated workforce.
- The Danish ISP study has found a high awareness as well as activity on innovation in the sectors. The companies develop their products, improve their processes and organisations and they find new customers and markets. Though, all in all, these innovation activities may be considered as minor and very incremental in scope and effect. Their mere existence and the awareness on change and development, the activities create, serve as a good basis for the future for the companies within the sectors studied within the peripheral area of Viborg and Ringkoebing counties. It is important to disseminate this experience to all companies within the sectors and to other sectors in peripheral areas.

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Appendix 1: Tables on innovation networks

A1.1 Agri-food industry

Table A1.1. Operators in the agri-food industry: Did the firm have any co-operation arrangements with, or utilize any of the services provided by, the following parties, in relation to implementing novelties (innovation activities), in the last 24 months? Number of yes-answers shown

Type of partner	Number of companies (n=5)	Number of farmers (n=4)
Internal:		
- Parent company or other enterprises within your enterprise group	1	0
Market:		
- Suppliers of equipment, materials, components or software	5	4
- Clients or customers	3	2
- Competitors and other firms from the same industry sector	5	2
Education and R&D:		
- Universities or other education institutes	5	1
- Government or private non-profit research institutes	2	2
- Commercial laboratories /R&D enterprises	5	0
Other institutional sources:		
- Public regulatory authorities	5	3
- Development agencies	1	0
- Business consultants/experts	3	1
- Industry associations and/or professional networks	4	4
- Interest groups and/or public sphere movements	4	0
- Financial institutions/actors	4	4
- Neighbours or other personal networks	3	3
- Others	0	0

Table A1.2. Supporting agents in the agri-food industry: Does your organization currently have any formal or informal partnership or co-operation with any organizations of the following categories?

Type of partner	Viborg County	VIFU	Agri-cultural School	Process Tech-nology	NVU Thisted	Farmers' Asso-ciation
Universities or other education institutes	F & I	F	F	F & I	F	-
Government or private non-profit institutes	F & I	I	I	F	F	F & I
Commercial laboratories / R&D enterprises	F & I	F	-	F	I	I
Public regulatory authorities	F & I	F	F	F	F	I
Development agencies	F & I	F	F	F	F	I
Business consultants / experts	-	I	I	-	I	-
Industry associations and/or professional networks	F & I	F	F	F	F	-
Interest groups and/or public sphere movements	F & I	F	F	F	I	I
Financial institutions/actors	F	F	F	F	F	I

Note:

F = Formal partnership

I = Informal partnership

A1.2 Tourism industry

Table A1.3. Operators in the tourism sector: Did the firm have any co-operation arrangements with, or utilize any of the services provided by, the following parties, in relation to implementing novelties (innovation activities), in the last 24 months? Number of yes-answers shown

Type of partner	Number of companies (n=5)
Internal:	
- Parent company or other enterprises within your enterprise group	1
Market:	
- Suppliers of equipment, materials, components or software	4
- Clients or customers	3
- Competitors and other firms from the same industry sector	3
Education and R&D:	
- Universities or other education institutes	3
- Government or private non-profit research institutes	1
- Commercial laboratories /R&D enterprises	0
Other institutional sources:	
- Public regulatory authorities	5
- Development agencies	3
- Business consultants/experts	0
- Industry associations and/or professional networks	2
- Interest groups and/or public sphere movements	3
- Financial institutions/actors	1
- Neighbours or other personal networks	5
- Others	0

Table A1.4. Supporting agents in the tourism sector: Does your organization currently have any formal or informal partnership or co-operation with any organizations of the following categories?

Type of partner	Viborg County	Ringkoebing County	Regional Tourism Organisation	Destination company	Nova Media*
Universities or other education institutes	F & I	F & I	F & I	-	F & I
Government or private non-profit institutes	F & I	F & I	F & I	F & I	F & I
Commercial laboratories / R&D enterprises	-	-	-	-	I
Public regulatory authorities	F & I	F & I	F & I	F & I	F & I
Development agencies	F & I	F & I	F & I	F & I	F & I
Business consultants / experts	-	F & I	F & I	F & I	F & I
Industry associations and/or professional networks	F & I	F & I	F & I	F & I	F & I
Interest groups and/or public sphere movements	F & I	F & I	F & I	F & I	F & I
Financial institutions/actors	F	F	-	F	F

Note:

* Agent offering education.

F = Formal partnership

I = Informal partnership

A1.3 Furniture industry

Table A1.5. Operators in the furniture industry: Did the firm have any co-operation arrangements with, or utilize any of the services provided by, the following parties, in relation to implementing novelties (innovation activities), in the last 24 months? Number of yes-answers shown

Type of partner	Number of companies (n=6)
Internal:	
- Parent company or other enterprises within your enterprise group	2
Market:	
- Suppliers of equipment, materials, components or software	5
- Clients or customers	6
- Competitors and other firms from the same industry sector	1
Education and R&D:	
- Universities or other education institutes	4
- Government or private non-profit research institutes	2
- Commercial laboratories /R&D enterprises	0
Other institutional sources:	
- Public regulatory authorities	3
- Development agencies	1
- Business consultants/experts	1
- Industry associations and/or professional networks	2
- Interest groups and/or public sphere movements	0
- Financial institutions/actors	0
- Neighbours or other personal networks	0
- Others	0

Table A1.6. Supporting agents in the furniture industry: Does your organization currently have any formal or informal partnership or co-operation with any organizations of the following categories?

Type of partner	Skive Carpenters' Guild	Development Centre for Wood and Furniture	Salling Development Council	Skive Technical School
Universities or other education institutes	F	F & I	F & I	F
Government or private non-profit institutes	-	F	I	-
Commercial laboratories / R&D enterprises	-	F & I	I	-
Public regulatory authorities	-	F & I	F & I	-
Development agencies	F & I	F & I	F & I	-
Business consultants / experts	I	F & I	F & I	F & I
Industry associations and/or professional networks	F & I	F & I	F & I	F
Interest groups and/or public sphere movements	-	-	F	-
Financial institutions/actors	F	F & I	F & I	-

Note:

F = Formal partnership

I = Informal partnership

Appendix 2 Key informants (interviewees)

A2.1 Agri-Food industry

Farmers

Bagge, Preben. Organic milk producer (est. 1984). Turnover: DKK 1.9 million (stable). Only temporary employment, wife is working off-farm.

Dalsgaard, Søren. Organic plant producer (est. 1989). Turnover: DKK 650,000 (increase is expected). No employees, wife is working on the farm.

Kristensen, Tage. Conventional plant producer (est. 1959). Turnover: app. DKK 1 million (stable). No employees, wife is working on the farm.

Noe, Arne. Organic milk producer (est. 1984). Turnover: DKK 1.3 million (increase is expected). No employees, wife is working on the farm.

Companies

Geisler, Mette. Production manager. Malt house: Dragsbæk Maltfabrik A/S (est. 1873). Turnover: about DKK 200 million (stable). 34 employees.

Grud, Kjeld. Production manager for plant production. Feeding stuff company: DLG Limfjord (a local branch). Turnover (locally): DKK 280 million (stable). 18 employees (locally).

Larsen, Ole. Assistant director/sales manager. Brewery: Thisted Bryghus A/S (est. 1902). Turnover: about DKK 22 million (excl. VAT and taxes) (increase is expected). 30 employees.

Nielsen, Peter Strange. Son of the owner and manager. Brewery: Hancock Bryggerierne A/S (est. 1876). Turnover: about DKK 30 million (excl. VAT and taxes) (stable). 35 employees.

Pedersen, Poul. Dairy manager. Dairy: Thise Mejeri (est. 1988). Turnover: DKK 120 million (increase is expected). 60 employees

Supporting agents

Bro, Bolette van Ingen. Director. Videnscenter for FødevareUdvikling - VIFU (Knowledge Centre for Food Development) (est. 2003), Holstebro.

Brynning, Gunhild and Britt Munkebæk. Double interview with student advisor (GB) and head of department (BM). Process technology education (est. 1989) at Holstebro Tekniske Skole (Holstebro Technical School), Holstebro.

Damgren, Henrik. Head of centre. Lemvigegnens Landboforening (the Farmers' Association of the Lemvig area) (est. 1856), Lemvig.

Larsen, Lotte Møller. Headmistress. Det grønne uddannelsescenter Lægaard (the green education centre Lægaard) (est. 1952), Holstebro Technical School, Holstebro.

Mortensen, Lauritz. Project manager. Nordvestjysk Uddannelsescenter – NVU (Northwest Jutland Education Centre) (est. 2001), Thisted.

Stensig, Torkil. Development employee. The development agency (est. 2001) at the business and labour market department in Viborg County, Viborg.

A2.2 Tourism Industry

Tourism operators

Kjeldsgaard, Maj-Britt. Owner of Fjand Gårdbutik (shop/gallery/café) (est. 1996, current owner 2003). Turnover: DKK 2.0 million (increasing). Husband co-owner, employed at the establishment. Two other family members working part time, one employee app. full time and two employees part time.

Kiilerich, Berit. Owner of Lystbækgaard (alternative sheep and wool centre) (est. 1999). Turnover not available (stable). The owner is the only employee. An association is established, and members do voluntary work.

Åkerstrøm, Jegvan. Owner of SAGA (sail schooner, arranging chartered trips.) (Est. 2000) Turnover DKK 1.2 million (SAGA, DKK 800.000 of this). Firm consists of husband and wife, full time employed.

Juhler, Finn. Manager of A/S Mindboen (cutter, charter boat for anglers/tourist) (est. 1999) Turnover: DKK 300.000 (stable). Two employees, sponsorship group consists of 40 members, some working on a voluntarily basis (e.g. in charge of reservation and bookings).

Madsen, Michael. Manager of an aquarium/coastal experience centre (est. 1999). Turnover DKK 2.5 million, and increasing, expected DKK 3 million in 2004. Four employees. (The operator has also taken the lease of the Coastal Experience Centre. Turnover DKK 3.0 million, four full time employees).

Intermediary firms

Erichsen, Knud. Director at Thylands Avis, a local weekly paper covering two municipalities, South Thy and Thyholm (est. 1912). Part of a larger newspaper company, with regional headquarters in western Jutland. Turnover (N.A). Five employees.

Svendsen, Poul. Owner of SydThy Rute og Turistfart, a coach company with local transport routes and coach travel, both inland and internationally. Turnover (N.A) Wife co-owner full time employed, in addition four full time employees.

Tangsig, Torben. Thy Medie. A Multimedia company responsible for creating "ThyWeb". Offers services like construction of homepages, portals and technical support (computers). Drew up a local/regional tourist paper in 2004. Turnover (tourism) paper 1.0 million DKK. Five employees.

Supporting Agents

Sørensen, Carlo. Project coordinator. Department of Regional Development, Ringkøbing County, Ringkoebing. Consist of 8 employees working with different aspects of regional development, e.g. tourism, rural development, EU programmes.

Brandsgaard, Sven Henrik. Tourism consultant. The Development Agency (est. 2001) at the business and labour market department in Viborg County, Viborg.

Hornum, Anni. Director, Tourist Group West Jutland (TGV), Nørre Nebel (regional tourism organisation) (est. 1991). Organisation responsible for marketing and developing tourism on the Danish West Coast, Ribe, Ringkøbing and parts of Southern Jutland and Viborg County. 8 employees, some working on a project basis.

Nielsen, Carsten. Director Destination Thy (Southern Thy). Covers an area of three municipalities in the northwestern part of the study region working with a common marketing strategy. The informant is also the tourist director locally in Southern Thy. Three employees.

Lørup, Karl Erik. Project coordinator, NOVA Media/TV Midt Vest (Educational Department at a Regional TV company). Offering a course covering marketing via the Internet, construction of homepages, directed at the tourist industry.

A2.3 The Furniture Industry

Companies

Thuesen, Thue. Managing Director, Thuka Furniture, Nykobing Mors. Founded 1949. Annual turnover app. DKK 400 million. App. 160 employees, more than ½ skilled. Children and teenage bedroom furniture in solid pine wood.

Jørgensen, Flemming E. Production Director, Bodilsen Furniture, Nykobing Mors. Founded 1973. Annual turnover app. DKK 1,113 billion. App. 1,430 employees (app. 900 in DK) at 10 factories in Denmark, one in Estonia and one in UK, 3/4 unskilled. Broad range of mainly pine wood furniture for large international customers.

Christensen, Per Chr. Managing Director, Ingabo Furniture, Oddense, Salling. Founded 1968, reconstructed 2002. Annual turnover app. DKK 25 million. App. 10 employees, ½ unskilled. Broad range of pine wood furniture for private homes.

Olesen, Kjeld. President & Chairman, Magnus Olesen Furniture, Durup, Salling. Founded 1937. Annual turnover app. DKK 40 mill. App. 40 employers, 2/3 unskilled. Office and conference furniture in varied/mixed materials for public and private customers.

Østergaard, Henrik. Production Director, Aage Oestergaard Furniture, Roslev, Salling. Founded 1964. Annual turnover app. DKK 260 million. App. 250 employees in Denmark, UK, Germany and France, 7/8 unskilled in production. Broad range of pine wood furniture for private homes.

Hansen, Jørgen S. Managing Director, Roslev Trælast, Skive. Founded 1900. Annual turnover app. DKK 350 million. App. 100 employees most with shorter formal education in sales. Importers and suppliers of wood and construction materials.

Supporting agents

Schrøder, Thomas. Head of Division, SkiveTeknisk Skole/Erhvervsakademi MidtVest (Skive Technical School/Business Academy Mid-West), Skive. (www.skivets.dk, www.eamv.dk). Established in the 1870s. Annual budget app. DKK 85 million. App. 160 employees and 660 students annually. Offers education programmes for machine technologist, wood technicians, process technologists and more.

Østergaard, Morten. Business Director, Salling Udviklingsråd (Salling Development Council), Balling, Salling. Established 1994. App. DKK 2.1 million in annual budget. 4 employees. Develops and offers business services and education activities for local companies and entrepreneurs.

Andersen, Ove. Director, Udviklingscenteret for møbler og træ (Development Center for Furniture and Wood), Skive. (www.moebelcenter.dk). Established 2001. Supported with DKK 15 million over 5 years with 50/50 self-finance of activities. App. 10-12 part time employees. Develops and offers new training and education activities together with local companies.

Christensen, Per Chr. Chairman, Skive Snedkerlaug (Skive Cabinetmakers Guild), Oddense, Salling. Established 1894. Annual budget app. DKK 150.000. App. 65 members. Offers 5-6 arrangements on relevant issues for the furniture industry, company visits etc. for the members.

CHAPTER 3: Case studies from Finland

3.1 The research context

3.1.1 Rural Finland

Finland is the most sparsely populated country in the EU (15 inhabitants per square kilometre), with a total population of 5.1 million and a land area of 337 000 km2. It is rural by nature, with vast forests, lakes and rivers. Lakes constitute about 10 per cent of the total land area and forest 70 per cent. The towns are tiny, except for the metropolitan area of Helsinki, with a population of 1 million. About 1 million people are living in sparsely populated areas and in localities with less than 500 inhabitants. [90]

The early history of Finland is that of an agrarian society. Space for settlement was cleared out of the forests and the people made their living from the land and water. The image of a successful citizen was that of a peasant farmer who was independent and self-sufficient. Even after the Second World War there was a belief in independent peasant life and family farms. The widely distributed production of foodstuffs and even spread of settlement over the country were looked on as safeguards against times of crisis, and this remained the national strategy for survival. Rural settlement and agricultural production was committed to the principles of small-scale operation. The post-war resettlement schemes as such came to an end in the 1960s. [91]

Rural livelihoods have traditionally been based on the forests and fields. The forests were the foundation of economic activities in the rural areas and for a long time the main source of export incomes. The forest industry developed into a large-scale operation and expanded into a global undertaking over the decades. In 1960s and 1970s the mechanisation of timber harvesting reduced the employment related to forestry in rural areas, and this together with the restructuring of agriculture and advancing industrialisation caused out-migration and altered the spatial distribution of population in the country.

The forests continue to provide a significant foundation for economic activity in rural areas, but the contribution of the related industries to employment in these areas has declined. Nowadays 80 per cent of the rural population make their living from sources other than primary production (forestry and agriculture).

There is no unambiguous operational definition of rural and urban areas, and the Finnish countryside is manifested in a number of ways, including almost urban population centres and large and small villages as well as scattered settlements. The rural heartlands are characterised by municipal centres and villages, with population densities lower than in the rural areas adjacent to towns but higher than in the sparsely populated areas, which comprise about half of the country.

The rural areas can be defined statistically either as sparsely populated areas or areas with a population density below a certain level, or as areas lacking municipal characteristics.

[90] Palttila & Niemi 1999

[91] Hyyryläinen & Uusitalo 2002

The most common statistical definition in the Nordic Countries defines rural areas as comprising all the territories lying outside the built-up, densely populated areas. Using the accepted definition of a densely populated area or population centre ("tätort"),[92] 82.1 per cent of Finland's population may be said to have lived in centres in 2001 and 17.9 percent in sparsely populated areas outside the centres (tätor).[93] The Nordic concept of "tätort" may be problematic, however, because some population centres are not urban. There can also be rural small centres, also referred to as tätort, and the sparsely populated areas ("glesbygden") near the bigger urban centres can belong functionally to these centres or have similar functions to them.[94] One solution to the problem of urban/rural definition has been to count both sparsely populated areas and centres with less than 500 inhabitants as rural areas. About one million Finns are living in rural areas defined in this way, which comprise as much as 99 percent of the total area of Finland[95]. One other solution is that adopted in the European Union, when the Commission defined rural areas as including all municipalities that have less than 30 000 inhabitants. This definition was employed in the Objective 5b programmes (1994-1999), for example.

A further definition is that used by the OECD, which is based on a population density criterion, the upper limit for a rural area being 150 inhabitants per km2. Applying this definition to Finland, 79 per cent of population could be said to live in rural areas and only 21 per cent in urban areas, which would consist almost entirely of the Helsinki conurbation. Finnish urban-rural figures are very different from the average for the OECD as a whole, where 35 percent of the population live in rural areas.[96]

Another approach to defining rural and urban areas is to classify the municipalities. This has been done for the purposes of national rural policy, for example: [97]

1. Urban areas (44 municipalities)
2. Rural areas adjacent to urban ones (148 municipalities)
3. Rural heartlands (178 municipalities)
4. Sparsely populated rural areas (129 municipalities)

The urban areas thus constitute the major centres, with adjacent rural areas economically integrated with them. Certain smaller towns also come into the latter category. The rural heartlands comprise mostly intermediate rural municipalities, while the sparsely populated rural areas are often the most remote of all.

[92] The Nordic statistics define "tätort" as a cluster of houses with at least 200 inhabitants and a distance of not more than 200 metres between the houses. For more about this definition, see the case studies from Iceland in this report.

[93] Kuntafakta, Statistics Finland 2004

[94] Rosenqvist 2002

[95] Palttila & Niemi 1999

[96] Virkkala & Lähteenmäki 2000

[97] Keränen 2000

3.1.2 Profile of Central Ostrobothnia and Oulu South

For the purposes of the Finnish case study, "the periphery" can be defined as the regions which are outside the main urban growth centres (the Helsinki, Turku, Tampere, Oulu and Jyväskylä regions), those in which the majority of new jobs have been generated since 1995. These centres have grown in terms of population, production and employment, while vast areas of the country have entered a vicious circle of depopulation, out-migration and local financial crises. For many stagnating regions based on traditional industries with low expectations of employment growth, this has been a serious problem, because they are already sparsely populated. These regions also suffer from problems of an ageing population, as the younger generation tends to move to larger cities in search of education and employment. Thus, Finland is becoming divided into two parts in terms of many aspects of welfare, with wealth and economic activity accumulating in the urban centres, although there is also long-term unemployment there.[98]

SELECTION OF THE AREA FOR THE CASE STUDY

The case study area selected for Finland consists of the region of Central Ostrobothnia and an area that can be referred to as Oulu South, comprising the southern part of the region of Northern Ostrobothnia. The area is located outside the main urban growth centres of Western Finland, as it lies north of Vaasa and south of Oulu (Figure 1). It can be characterised as a rural area with one small industrial town. This kind of settlement structure is a typical for many Northern Nordic regions.

Decription of the case study area in terms of population changes, migration, unemployment rates, the occupational and educational structure of the population and its position in the EU target areas requires the consideration of figures for subregions. Central Ostrobothnia is made up of two subregions, Kokkola and Kaustinen, and Oulu South comprises three, Nivala-Haapajärvi, Siikalatva and Ylivieska.

[98] Virkkala 2002b, Valtioneuvoston kanslia 2000, Scienstock 2004

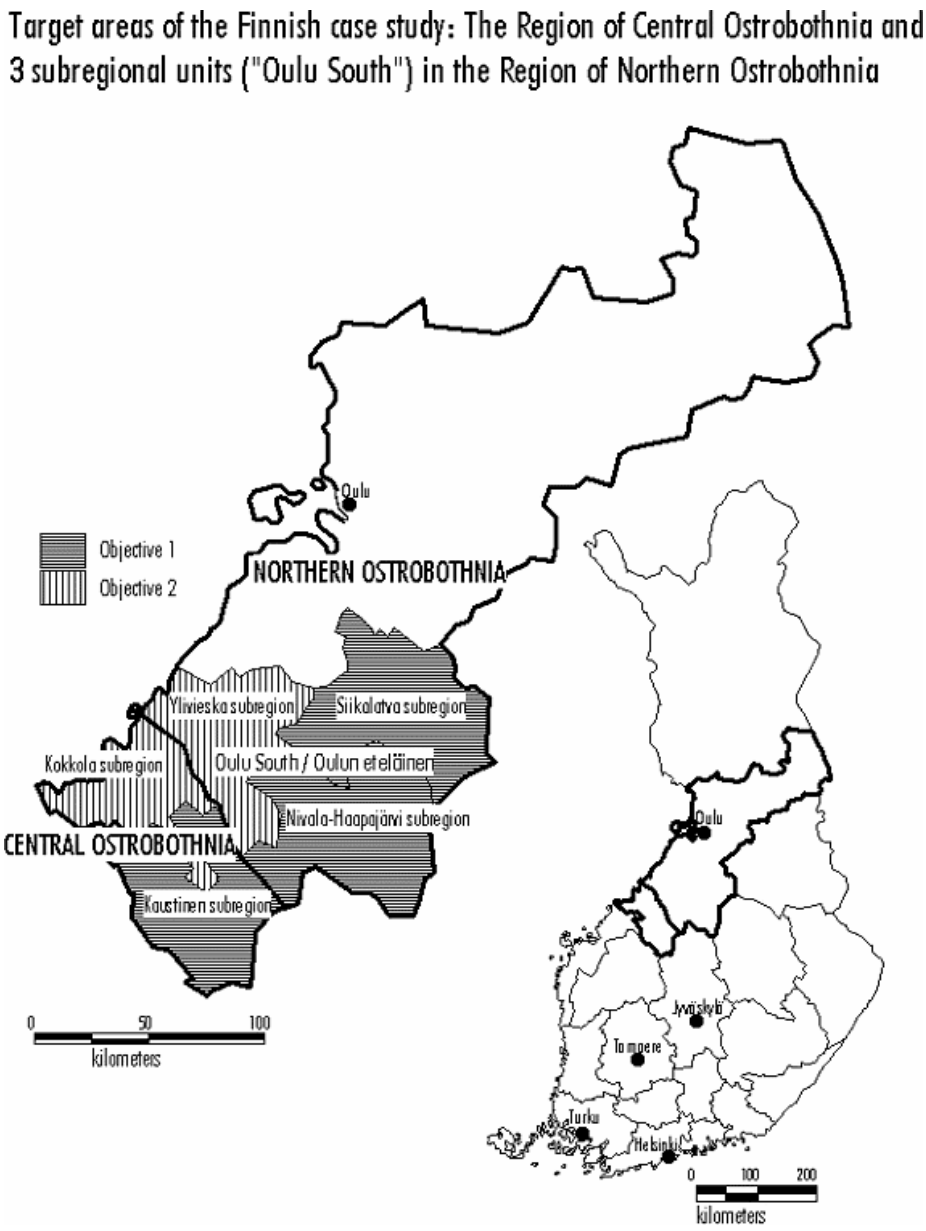


Figure 1. Target areas of the Finnish case study: Central Ostrobothia and Oulu South: three subregions of Northern Ostrobothnia.

The excess of births over deaths has been relatively high in this area, but because of out-migration, which amounted to 937 persons in 2003, the population is declining (Table 1). This has been true of all the subregions since the mid-1990s, although the decline seems to have been arrested in Kokkola in 2003, when it was highest in the more rural subregions. It has been forecasted by Statistics Finland that the population of every subregion of the area will decline in the future (Table 1)

Table 1. Changes in the population of the case study area in 2003, by subregions [99]

Subregion	Population	Migration	Excess of births over deaths	The total change in population in 2003 (%)
Kaustinen	18332	-119	33	-0.4
Kokkola	52269	-209	208	0.0
Nivala-Haapajärvi	31574	-288	26	-0.8
Siikalatva	16551	-158	5	-0.9
Ylivieska	39868	-163	133	-0.1
Total	*158594*	*-937*	*405*	

Since the economic crisis in the early 1990s, the unemployment rate in Finland has been higher than in other Nordic countries. The situation was worst in 1994, when that in Finland was 18.2 per cent. Successive Finnish governments have been committed to the goal of full employment, and during the period of recovery from the mid-1990s onwards, the unemployment rate was reduced by creating new job opportunities. It was nevertheless still 11.3 per cent in 2003. Unemployment rates in the subregions of the case study area are presented in Table 2. Two subregions have a better employment situation than the average for the whole country and three a worse situation. The unemployment in the industrial town like Kokkola has its origins in the collapse of one industrial sector (clothing) and the restructuring of the other main economic sectors during the economic crisis of the early 1990s, while that in the other subregions can be attributed mostly to restructuring processes in primary production.

Table 2. Unemployment rate (%) in the case study area in 2003, by subregion [100]

Subregion	Unemployment rate (%)
Kaustinen	8.5
Kokkola	12.5
Nivala-Haapajärvi	13.1
Siikalatva	11.4
Ylivieska	10.5
Finland	*11.3*

[99] Kuntafakta, Statistics Finland 2004

[100] Kuntafakta, Statistics Finland 2004

The third indicator, employment by sectors, is depicted in Table 3. The employment structure can generally be taken as reflecting the features of a regional economy. The table shows that all the subregions except for Kokkola are highly specialised in primary production, implying that the restructuring process in primary production is still going on in this area. The proportion of employees working in industry is also higher than the average for Finland, even though the figures for the subregions of Kaustinen and Siikalatva are below the average. The importance of the service sector is less pronounced than on average.

Table 3. Employment in the case study area in 2002, by sector and subregion [101]

	Share of places of employment (%)			
Subregion	**Primary sector**	**Industry, energy, construction**	**Services (incl trade)**	**Others or unknown**
Kaustinen	26.6	20.8	42.9	9.6
Kokkola	6.6	27.6	58.5	7.3
Nivala-Haapajärvi	19.8	26.6	46.2	7.4
Siikalatva	19.8	24.4	49.1	6.8
Ylivieska	12.1	30.2	51.6	6.2
Finland	*4.5*	*25.5*	*63.0*	*6.9*

The fourth indicator shows the educational structure of the population. The classification employed by Statistics Finland is into primary, secondary and tertiary education. 39 per cent of the whole population had only a primary education, i.e. primary school, in 2002, 36.8 per cent a secondary education, i.e. vocational school, upper secondary school or special vocational school, and 24.2 per cent a higher education, i.e. a university degree or other tertiary qualification (Table 4). The proportion of persons with a higher education is larger in the younger age groups because of the higher levels of investment in the provision of education for young people in more recent times.

The details regarding the educational levels of the population of the case study area contained in Table 4 show that the proportion of the persons with a secondary education or higher is somewhat smaller than that for the country as a whole, this difference being attributable to the smaller numbers of persons with a tertiary education. The proportion of persons with a secondary education is higher than in the whole country in the case of four of the subregions. The strength of the case study area, especially from the competence and innovation point of view, appears to lie in this high number of intermediate-level qualifications.

[101] Kuntafakta, Statistics Finland 2004

Table 4. Secondary and tertiary education among the population of the case study region in 2003 [102]

Subregion	Persons with at least a secondary qualification, %	Persons with a tertiary qualification[103], %	Persons with a secondary qualification[104], %
Kaustinen	**49.6**	13.6	36.0
Kokkolan	**58.2**	20.0	38.2
Nivala-Haapajärvi	**52.3**	13.8	38.5
Siikalatva	**53.2**	12.8	40.4
Ylivieska	**57.8**	17.1	40.7
Finland	***61.0***	*24.2*	*36.8*

To sum up the characteristics of the case study area in terms of population, employment structure, educational level and unemployment rate, it may be said that the area has a declining population employed primarily in primary production and manufacturing. A relatively small proportion of of its inhabitants have a tertiary-level education, but the proportion of the secondary qualifications corresponds to the national average. The unemployment rate does not deviate greatly from the national average.

The European Union has defined the less favourable regions inside the union as targeted regions for structural policy. Within our case study area, the Kaustinen, Nivala-Haapajärvi and Siikalatva subregions are part of the Northern Finland Objective 1 targeted region for 2000-2006 and the Kokkola and Ylivieska subregions belong to the Western Finland Objective 2 targeted region.

According to the rural policy classification of municipalities, the area belongs mostly to the rural heartland category, although it does possess one urban municipality, Kokkola, and one rural municipality adjacent to an urban one (Kälviä). Six municipalities in the subregions of Siikalatva and Nivala-Haapajärvi belong to the sparsely populated category, that of the most remote rural areas in Finland.[105]

[102] Kuntafakta, Statistics Finland 2004

[103] Higher education comprises lower higher education, high school education, upper high school and university education as well as research education leading to degrees. (Tertiary education)

[104] Middle degree is a degree from gymnasium (student), vocational school, or special vocation school. It means usually 2-3 years education after the primary school. (Secondary education)

[105] See chapter Rural Finland and Keränen et al. 2000. The sparsely populated rural municipalities are Kärsämäki, Pyhäjärvi, Pyhäntä, Kestilä, Pulkkila and Piippola.

SELECTION OF THE SECTORS

We have selected the food industry and tourism for case studies in Central Ostrobothnia and manufacturing in Oulu South. The case study of the food industry in Central Ostrobothnia includes milk production and various forms of small-scale food processing, but not the grain cultivation typical of agriculture in Southern Finland, for example, while the case study of tourism represents a region without mass tourism and where tourism is not a central focus of attention, although there is a great potential for developing it.

Manufacturing in Oulu South concerns branches of the electronics industry related to the ICT cluster, and is thus representative in some respects of manufacturing in the rural areas of Finland, where the large industrial enterprises that dominate this industry have many of their subcontractor SMEs.[106] A localised industrial agglomeration such as that engaged in electronics in Oulu South is a typical model for industry in Ostrobothnia. At the same time, the electronics industry in Oulu South is well integrated into the national cluster, so that our focus will be on the role of rural manufacturing firms in the national ICT cluster.

PROFILE OF THE CENTRAL OSTROBOTHNIA REGION

Central Ostrobothnia is located on the west coast of Finland, approximately 500 kilometres north of Helsinki. With approximately 70 600 inhabitants,[107] it is the smallest of the 19 regions[108] of mainland Finland in terms of population. It comprises 12 municipalities, grouped into two subregions[109], Kokkola and Kaustinen, and has a total area of 5 474 square kilometres, of which 5 286 square kilometres is land[110].

The town of Kokkola, with a population of approximately 35 800,[111] is the centre of Central Ostrobothnia, while the Kokkola subregion,, which also includes the small town of Kannus and three other municipalities, Kälviä, Lohtaja and Himanka, has approximately 52 300[112] inhabitants. The Kaustinen subregion has approximately 18 300[113] inhabitants and comprises seven municipalities, Kaustinen, Veteli, Halsua, Ullava, Perho, Toholampi and Lestijärvi.

[106] SMEs = Small and medium-sized enterprises

[107] 70 584 inhabitants as of 31st December 2003 (Statfin, Statistics Finland)

[108] Under a Government decision of 1 March 1998, 19 regions were established in mainland Finland for the purposes of the state's regional administration. In addition to these, there is the province of the Åland Islands. (www.intermin.fi).

[109] A subregion is a territorial statistical unit smaller than a region (in EU terms, a NUTS IV region). Under the Regional Development Act, subregions are defined mainly on the basis of employment and cooperation between municipalities. There are a total of 79 subregions in mainland Finland. Parameters representing regional development are monitored at the subregional level, and the areas eligible for national business aid and areas covered by the EU's regional objectives are defined on the basis of these parameters (www.intermin.fi).

[110] Kuntafakta. Statistics Finland.

[111] 35 756 inhabitants as of 31st December 2003 (Statfin, Statistics Finland)

[112] 52 252 inhabitants as of 31st December 2003 (Statfin, Statistics Finland)

[113] 18 332 inhabitants as of 31st December 2003 (Statfin, Statistics Finland)

Kokkola is the only urban municipality in the region according to the Statistics Finland classification, while Kannus is a semi-urban municipality and all the others are rural municipalities.[114]

The population density of Central Ostrobothnia as a whole is 13.4 inhabitants per square kilometre[115], the corresponding figure for the subregion of Kokkola being 26.2 and that for the subregion of Kaustinen 5.6[116]. The population has decreased due to out-migration, and population forecasts suggest that this trend will continue[117].

The main north-south railway line passes through the area, the Kruunupyy airport is situated approximately 20 kilometres from Kokkola. The Port of Kokkola is one of the most important ones in the northern part of the Gulf of Bothnia and one of the main transit traffic ports in Finland. The area has an advanced telecommunications network infrastructure.[118]

Typical features of the structure of economic life in Central Ostrobothnia are the strong position of the metals industry, wood processing and the chemicals industry on the one hand and that of agriculture on the other. The Kokkola and Kaustinen subregions differ markedly in the structure of production, the strong sectors in the Kokkola region on a national scale and in terms of regional employment the national comparison being chemicals, the manufacture of basic metals, the food industry, retailing, agriculture and land transport, with boat-building, clothing, furs and leather goods also of regional importance, whereas the Kaustinen subregion is one of the most heavily dominated by primary production in the whole of Finland, with its biggest turnover from agriculture obtained from milk production.[119] A higher proportion of people in the Kokkola subregion are employed in industry, energy generation and construction than the average for Finland as a whole, while the proportion engaged in the service sector (including trade) is lower than average (Table 3).

In terms of EU programmes, the Kokkola subregion belongs to the Western Finland Objective 2 Programme and the more sparsely populated subregion of Kaustinen belongs to the Northern Finland Objective 1 Programme[120].

The following three "separate" national programmes are being carried out in the area of Central Ostrobothnia: the Regional Centre Programme for the Kokkola subregion, the

[114] Urban municipalities are those in which at least 90 per cent of the population live in urban settlements, or in which the population of the largest urban settlement is at least 15 000. Semi-urban municipalities are ones in which at least 60 per cent but less than 90 per cent of the population live in urban settlements, and in which the population of the largest urban settlement is at least 4 000 but less than 15 000. Rural municipalities are those in which less than 60 per cent of the population live in urban settlements, and in which the population of the largest urban settlement is less than 15 000, together with those in which at least 60 per cent but less than 90 per cent of the population live in urban settlements and in which the population of the largest urban settlement is less than 4 000 (www.stat.fi).

[115] Kuntafakta. Statistics Finland.

[116] Kuntafakta. Statistics Finland.

[117] Statfin, Statistics Finland.

[118] Keski-Pohjanmaan liitto 2003, 4

[119] Keski-Pohjanmaan liitto 2003, 5, 12

[120] See chapter Regional policy: from state policy to multilevel development policy

Kokkola Region Centre of Expertise Programme in Chemistry and the Net-Polis programme.[121]

In terms of education and research institutes, the following are the main actors in the region:

The Chydenius Institute – Kokkola University Consortium is an independent university-level teaching and research unit affiliated to the University of Jyväskylä and operating under the auspices of the universities of Jyväskylä, Oulu and Vaasa. The institute aims to support economic and intellectual growth in Central Ostrobothnia by means of education and research and to improve the inhabitants' access to university-level studies, partly on a networking principle. It offers education leading to a university degree, continuing education and open university courses, an also carries out research in the social sciences, education and computer science.[122]

The Central Ostrobothnia Polytechnic, which operates in Kokkola and three other towns: Pietarsaari, Ylivieska and Haapajärvi (of which Ylivieska and Haapajärvi are located in Oulu South and Pietarsaari is not far from Kokkola but lies ouside our case study area), offers 25 degree programmes, of which those in technology, business and administration, natural sciences, health and social services, and culture can be studied in Kokkola.[123] Centria, the polytechnic's research, development and further education unit operates in a networked manner between Kokkola, Ylivieska, Pietarsaari and Haapajärvi to implement applied research and development projects mainly in cooperation with enterprises and communities in the area.[124]

The Federation of Education in Central Ostrobothnia, an educational and developmental organisation owned by municipalities in the region, is responsible for arranging and providing vocational education services, encouraging entrepreneurial activities and generally contributing to the development of the region. Upper secondary-level vocational education is available in the following sectors: technology and transport, health and social services administration and commerce, land-based production, culture, and youth and leisure. The federation owns the Central Ostrobothnia Adult Education Centre and Central Ostrobothnia Technology Centre.[125]

The Central Ostrobothnia Adult Education Centre offers tailored vocational education and development services to firms and other organisations, including courses leading to a formal qualification.[126]

The Central Ostrobothnia Technology Centre (Ketek) is a business unit with expertise in applied research and development in technology, with the aim of promoting regional development, technology transfer, innovations and business services for enterprises. Its

[121] Keski-Pohjanmaan liitto 2003

[122] www.chydenius.fi

[123] www.cop.fi

[124] www.centria.fi

[125] www.kpedu.fi

[126] www.kpakk.fi

research and development and also technology transfer functions are focused on the industrial applications of chemistry and production engineering technology .[127]

Culture is one of the strengths of the Central Ostrobothnia region. Good examples of this are the Ostrobothnian Chamber Orchestra and the Kaustinen Folk Music Festival. The landscape of the region is a flat plain cut by rivers flowing to the north-west.

PROFILE OF OULU SOUTH

Oulu South is located to the east of Central Ostrobothnia and 100-200 kilometres south of Oulu. It is the southern part of the region of Northern Ostrobothnia and its local economy is linked to that of Oulu, which is the growth centre of Northern Finland. The area has a population of about 89 000 and consists of 17 municipalities, making up the subregions of Ylivieska, Nivala-Haapajärvi and Siikalatva. These subregions are networked together to form a stronger area which lies somewhere between a subregion and region.

Oulu South is not a cultural unit with a history of its own, the name having been adopted in 1997, when the subregions and municipalities began to co-operate more intensively, largely in the fields of planning, regional higher education strategy, sustainable development, joint welfare services and a network of priority projects. This networking was further developed in the Oulu South Regional Centre Programme of 2001, for responding to new opportunities, improving competitiveness and processing new models, especially in the digital economy and e-solutions. The programme places emphasis on contract-based production and high technology, functioning in practice through eight development networks concerned with the wood industry, the metal industry, welfare, information technology, the food industry, rural development, culture and tourism projects. The programme also forms part of the set of regional centre programmes for Northern Ostrobothnia, which aims at balancing migration and spreading the skills and knowhow of the Oulu region to wider areas, i.e. promoting bottom-up development and cross-sectoral integration and co-operation.[128]

Oulu South lacks a clear regional centre, but is instead a networking unit formed by three equally large subregions. There are no urban municipalities, but six of the municipalities can be characterised as semi-urban and 11 as rural. The largest municipality, Ylivieska, had about 13 185 inhabitants in 2003, Nivala 10 901, Kalajoki 9 088 and Oulainen 8 198. All these subregions have been declining in population since 1995, but more slowly than other correspondingly rural areas of Finland on account of the high birth rate. The population of Oulu South can be characterised as highly homogenous, the proportion of the inhabitants with Finnish as their native language being 100 per cent, and that of foreigners 0.45 per cent in 2002. [129]

In terms of EU programmes, the Ylivieska subregion belongs to the Western Finland Objective 2 area and the Siikalatva and Nivala-Haapajärvi subregions to the Northern Finland Objective 1 area. Apart from the Regional Centre Programme, the area belongs to Centre of Expertise Programmes for the metal industry and ICT-related industries.

[127] www.ketek.fi

[128] Oulun eteläinen aluekeskusohjelmaehdotus 2001

[129] Statistics Finland, Kuntafakta 2004

Oulu South is specialised in agriculture and milk production, and also in mining, on account of the Pyhäsalmi mine in the Nivala-Haapajärvi subregion. More people in the Ylivieska subregion are employed in industry, energy generation and construction than on average in Finland, the most important manufacturing subsectors being the metal industry, wood processing and electronics. The importance of services (including trade) is much smaller than the national average (Table 3), possibly due to the small amount of state sector employment.

The region has become more industrialised in the last decade, jobs in primary production having declined by 35 per cent between 1993 and 2001, while jobs in industry increased by 36 per cent.[130]

Two polytechnics have facilities in Oulu South, the Central Ostrobothnia Polytechnic in Ylivieska (technology) and Haapajärvi (business and administration) and Oulu Polytechnic in Oulainen (Nursing). The Centria unit of the Central Ostrobothnia Polytechnic has 50 experts in the area, working on education, development and research projects dealing with regional innovation co-operation.

The Oulu South Institute, founded in the area in 2001 by the University of Oulu, is devoted to organising education and carrying out research and development work, especially in electronics and other regionally relevant sectors.

3.1.3 The agrifood sector in Finland

AGRICULTURE

The operating environment for the Finnish agriculture and food sector has changed considerably over the past ten years. Membership of the European Union altered the core of Finland's agricultural policy, as the national policy and protected market were replaced by the common agricultural policy EU and internal market and the subsequent changes in the common agricultural policy and in the competitive situation on international markets have affected the position of Finnish agriculture in a number of ways.[131]

Agricultural production in Finland has become more concentrated both regionally and at the farm level as a result of EU membership, have shifted geographically towards the south and west. The magnitude and pace of the changes have varied according to the products concerned, and production has also become concentrated within the regions, moving away from the remote rural areas, both nationally and regionally. Thus the number of farms has fallen most rapidly in the eastern and northern parts of the country. Production is also tending to be concentrated in larger farms, the proportion of which has increased.[132]

There were approximately 73 000 farms in Finland in 2003[133], so that although there has been a considerable decrease in the proportion of the labour force engaged in agriculture, it is still

[130] Antinoja & Hakuli 2003, 21

[131] Ministry of Agriculture and Forestry 2001, 3

[132] Ministry of Agriculture and Forestry 2001, 16

[133] Maa- ja metsätalousministeriön tietopalvelukeskus, according to Statistics Finland, www.stat.fi

an important source of employment[134]. Almost 99 000 persons were employed in agriculture in 2003, 4.2 per cent of the employed labour force[135].

The structure of agricultural production has also altered considerably on account of EU membership the proportion of farms engaged in livestock rearing having decreased and that engaged in crop production having grown. 39 per cent of the active farms in 2003 were specialised in livestock and approximately 57 per cent in crop production, here the corresponding figures in 1995 had been 52 per cent and 39 per cent, respectively.[136]

Approximately 26 per cent of the active farms practice dairying as their main line of production, and this is the most significant sector of Finnish agriculture in terms of the total value of production, accounting for approximately half of its total market-price sales income (50 per cent in 2003).[137]

At the end of 2003 there were 17 600 farms delivering milk to dairies in Finland, implying that almost 1 300 farms had ceased milk production in the course of that year. At the same time the number of dairy cows had been reduced to 332 800. The amount of milk delivered to the dairies was approximately 2 324 million litres and the average output of milk per cow was 7 245 litres. Milk production has exceeded the country-specific milk quota laid down by the CAP consistently since 1999. The average size of a dairy herd in 2003 was 18.3 cows.[138]

Finnish agriculture is based on family farms, with private persons owning 89 per cent of the farms in 2003 and family companies and the estates of deceased persons the remaining 11 per cent.[139] The average arable area of an active farm was 31.0 hectares, where the corresponding figure in 1995 was 22.8 hectares. Thus despite the structural development, most Finnish farms are still relatively small. The cultivated area has increased mainly through the leasing of land rather than purchases, so that 39 per cent of the total of 2.2 million ha under cultivation in 2003 was leased land.[140]

The very short growing and pasturing seasons in the north combined with the low cereal and grass yields lead to high production costs per hectare and livestock unit, and thus constitute a permanent competitive disadvantage for agriculture in northern regions[141]. In many places livestock farming, especially dairy farming, is the only profitable form of production[142]. In addition, the small, scattered parcels of arable land, the need for efficient machinery because of the short sowing and harvesting periods and the need for drying the hay and cereals for storage all raise production costs further , as do the sparse population, the remote location of many farms, the lack of local markets and the long transport distances [143]

[134] Ministry of Agriculture and Forestry 2001, 9

[135] Niemi & Ahlstedt 2004, 13

[136] Niemi & Ahlstedt 2004, 22

[137] Niemi & Ahlstedt 2004, 22

[138] Niemi & Ahlstedt 2004, 33

[139] Niemi & Ahlstedt 2004, 21

[140] Niemi & Ahlstedt 2004, 20

[141] Ministry of Agriculture and Forestry 2001, 17

[142] www.mtk.fi

[143] Ministry of Agriculture and Forestry 2001, 17

Finnish agriculture also possesses a number of traditional strengths, however, most notably its unpolluted and environmentally friendly production processes and products, traceability and high production ethics. Serious animal and plant diseases are extremely rare and the animals are treated well.[144]

The agricultural support scheme in Finland is founded on forms of support paid under the EU's Common Agricultural Policy, complemented by a national support scheme that takes account of assessments of farmers' incomes in different regions and lines of production, mainly based on data from bookkeeping farms.[145] CAP and national support combined represented 44 per cent of the income of Finnish farms in 2003. This substantial proportion arises because production costs are high due to the adverse natural conditions and weaker production structure than in competing countries.

The steering group of an agricultural strategy project launched by the Ministry of Agriculture and Forestry arrived at the following national objectives for Finnish agricultural policy in the present decade:[146]

- Reinforcing consumer-oriented action in the whole food chain
- Securing the profitability and operating conditions of agriculture
- Developing a more equitable and socially, economically and ecologically sustainable common agricultural policy
- Increasing interaction between agricultural and rural policy
- Promoting structural development in agriculture
- Improving the functioning of markets

Likewise, there exists a National Quality Strategy for the Food Sector, drawn up in 1999 and revised jointly by the various parties involved in the food chain. The new strategy was adopted at the beginning of 2004. The objectives are to reinforce the competitiveness of the food chain, improve the competitive advantage of Finnish foodstuffs and implement socially responsible practices in the food sector.[147]

FOOD INDUSTRY

The EU Common Agricultural Policy sets the institutional standpoints not only for agriculture but also for the whole food industry. The food sector is a mature industry with relatively slow growth potential. [148]

The Finnish food sector has experienced radical and rapid changes in its market environment during the last decade. Structural adjustment and rationalisation have been rapid since the late 1980s, when food companies began to prepare for of the European Union, and once this came in 1995, the import-restricted food markets enlarged into EU-wide markets. This together with the gradual liberalisation of world trade has meant that imports of food products have

[144] Ministry of Agriculture and Forestry 2001, 17

[145] Ministry of Agriculture and Forestry 2004, 8

[146] Ministry of Agriculture and Forestry 2001, 3

[147] Ministry of Agriculture and Forestry 2004, 17

[148] Forsman 2004, 8

increased, causing pressures on the domestic food industry to increase cost-efficiency in order to be competitive on both the national and international level. Activities were centralised and the number of production plants has decreased. Many large firms reduced the number of products in order to focus more on their core national or international products and brands, a trend that has provided opportunities for smaller firms to fill the niches left by them. Particularly after the recession of the late 1990s, a clear trend began to emerge among some consumer segments towards food products that were differentiated in some way from the bulk products.[149]

As a consequence of this development, the Finnish food sector has become increasingly polarised. On the one hand, there are national and international companies generating food products in large volumes and marketing them over the whole country, while there are small firms operating mainly in local markets and trying to differentiate their products from those of the larger companies.[150]

The Finnish food market is relatively small by comparison with European markets, and the Finnish food industry is characterised by high concentration of large firms within certain branches and a large number of small firms, so that a total of 2,388 firms existed in the food industry in 2002[151], implying that it is highly small-business oriented.[152]

It is also significant that approximately half of the small food-processing firms in Finland are located in rural areas, a proportion that has increased markedly since the late 1980s.[153] Some of these rural enterprises operate in connection with farms and their business idea is largly based on processing and marketing their farm's products. Great interest has been shown in entrepreneurship in rural food processing, because the resuling products are in great demand.[154]

The power of the retail sector has increased in recent years and it can be expected to continue to grow. This is largely a consequence of efficient logistics, since a few retail chains control most of the distribution and logistics related to food products. The concentrated structure of the retail level is nevertheless a crucial entry barrier for small food processors.[155]

About 85% of the food consumed in Finland is produced nationally. The success of the Finnish food industry is largely based on the use of domestically produced ingredients of the highest quality, combined with a high level of technological know-how. The development of functional foods has been a key research goal for many companies, and has led to a number of highly significant health promotion products.[156]

Food production ranks fourth among Finland's industries in terms of the gross value of production, which was 8.8 billion euros in 2003, with a value added of 2.2 billion euros. The

[149] Forsman 2004, 7

[150] Forsman 2004, 7

[151] Statistics Finland

[152] Forsman 2004, 8

[153] Forsman 2004, 8

[154] Forsman 2001, 5

[155] Forsman 2004, 8

[156] www.etl.fi

industry employs about 37 000 people, and its main branches are meat processing, dairying, bakeries, brewing and soft drinks.[157]

THE DAIRY INDUSTRY

Finland has a high consumption of liquid milk , the market for which is diversified in the direction of acidified and cultured products such as yoghurt and "viili".The production of butter in 2003 was 58 million kilos and that of cheese 97 million kilos[158]. Cheese making is the second most important use of milk in Finland. Domestic consumption is high, and cheese accounted for 12.8 per cent of total food exports[159]. The strength of the Finnish dairy industry lies in its investments in sophisticated technology and innovations, which has led to the development of cultures, fat and protein fractions, nutri food, infant formulas and other novel products.[160]

A major structural change has taken place in the dairy industry, with a trend from regional/local dairies to large, nationally operating ones. The Finnish dairy industry is dominated by Valio, which is owned by 28 dairy cooperatives representing 14 300 producers and has 16 production plants in Finland.[161] A second major force is Ingman Foods, with 5 production plants in Finland[162]. Altogether there are approximately 40 dairies in Finland, including a growing number of small enterprises, mostly making cheese[163].

3.1.4 The agrifood sector in Central Ostrobothnia

Agriculture is an important sector for Central Ostrobothnia, especially for the Kaustinen subregion, where over one fourth of all jobs are in the primary sector. Dairy farming in Finland has become concentrated regionally, so that at the moment half of the country's milk is being produced in four regions,[164] and one of these is Central Ostrobothnia, where the quantity produced increased by 20 per cent in 1995 – 2000[165]. Thus, where there were 1 259 farms in the region in 2002, 791 of these, or approximately 63 per cent, were dairy farms, while 119 were other cattle rearing farms, 36 pig farms, 136 arable (grain) farms and 177 grew other crops.[166]

According to Statistics Finland, there were 44 places of business in the food industry in Central Ostrobothnia in 2002, and 822 employees, almost a half of whom, 409 persons, were working in the meat processing industry. There are in fact only three meat firms in Central Ostrobothnia, and the large proportion of these employees is explained by one single firm.

[157] www.etl.fi

[158] Maa- ja metsätalousministeriön tietopalvelukeskus, according to Statistics Finland, www.stat.fi

[159] Niemi & Ahlstedt 2004, 46

[160] Korsström & Lampi 2001, 21; Niemi & Ahlstedt 2004, 46

[161] www.valio.fi

[162] www.ingman.fi

[163] www.etl.fi

[164] Maa- ja metsätalousministeriö 2004, 20

[165] Maa- ja metsätalousministeriö 2004, 20

[166] www.stat.fi

Correspondingly, there were 147 persons employed in five dairy firms. The gross value of production in the food processing enterprises of the region was 179 million euros, of which 45 per cent was generated in the dairy industry (excluding dairy farms) and 35 per cent in meat processing[167] (Table 5).[168]

Table 5. The food industry in Central Ostrobothnia, numbers of companies, personnel and gross value of production in 2002[169].

Branch of food processing products and beverages	Companies	Personnel	Gross value of production 1 000 euros
Production, processing and preserving of meat and meat products	3	409	62 074
Processing and preserving of fish and fish products	2	x	x
Processing and preserving of fruit and vegetables	4	8	590
Manufacture of dairy products	5	147	80 114
Manufacture of grain mill products, starches and starch products	1	x	x
Manufacture of prepared animal feeds	6	64	19 867
Manufacture of other food products[170]	21	127	10 174
Manufacture of beverages	2	x	x
Total	*44*	*822*	*179 155*

[167] Statfin. Statistics Finland.

[168] The official statistics do not necessarily include all companies. The Ruoka-Suomi (Food Finland) statistics, for instance, mention 10 companies with more than 20 employees in the food industry in Central Ostrobothnia and 56 with less than 20 employees (including self-employed persons). 23 of the latter are engaged in processing vegetables, berries or fruits. (www.tkk.utu.fi/ruokasuomi).

[169] Statfin, Statistics Finland.

[170] The class ”manufacture of other food products” includes the baking of bread, for example.

3.1.5 Rural tourism in Finland

ECONOMIC IMPACTS OF TOURISM IN FINLAND

Tourism as an industry covers several sectors, the most important among which are transport, hotels and restaurants. In addition, several other sectors and activities such as services, including culture, leisure, sport and retail trading, are either directly or indirectly linked with it.[171] The number of enterprises in Finland as a whole in 2002 that could be regarded as typical of tourism was 13 583 and the number of places at which they operated totalled 16 367[172].

The total number of overnight stays at accommodation facilities in Finland in 2003 was 16 081 812, of which Finnish visitors accounted for 11 751 122 (approximately 73 per cent) and foreign visitors, mainly from Russia, Sweden, Germany, Great Britain and Estonia, 4 330 690 (approximately 27 per cent)[173,174].

A study of the impact of tourism on the regional economy[175] has shown that, the number of person/years of employment within this industry in Finland in 2000 was 51 967 representing 4.1 percent of the total person/years in all sectors of the economy. Since direct revenues from tourism (€ 6.9 billion) represented about 2.7 percent of the total turnover for all industrial sectors in Finland in the same year 2000, it may be concluded that tourism is a labour-intensive industry. On the other hand, there was a growth of 33 per cent in direct revenues from tourism during the period of 1995 – 2000 (after allowing for inflation), whereas the corresponding increase in terms employment impact was 23 per cent, so that an increase in the productivity of labour in tourism can be detected.[176]

The absolute value and the relative importance of the revenue from tourism and the employment impact vary from region to region in Finland, the absolute figures for both being greatest in the core regions and larger cities. Thus the total revenue from tourism in the Uusimaa, Varsinais-Suomi and Pirkanmaa regions combined represents 65 per cent of the total for the whole country. The relative importance of tourism is nevertheless much greater in the peripheral regions and rural areas, since it plays the most important role in the regional economies of Åland, Lapland, Southern Savo and Kainuu.[177]

FINNISH TOURISM POLICY AND MAIN ACTORS[178]

The main responsibility for Finnish tourism policy rests with the Ministry of Trade and Industry, which is responsible for the general development of tourism and for coordinating

[171] www.ktm.fi

[172] Statistics Finland, according to www.ktm.fi

[173] Statistics Finland according to MEK (www.mek.fi)

[174] Matkailun edistämiskeskus 2004, 14

[175] Laakkonen 2002

[176] Laakkonen 2002

[177] Laakkonen 2002

[178] www.ktm.fi

support measures. The other main actors in the public sector are the Finnish Tourist Board (MEK), which is responsible for promoting in-coming tourism and supporting the development of tourist services in Finland, the National Consumer Agency, which keeps a register of tour operators, the Ministry of the Interior, which is closely linked with the development of tourism ,and the Ministry of Agriculture and Forestry, which promotes rural tourism, accommodation on farms and environmental tourism on the basis of small enterprises and networking).

The local and regional actors that bear the primary responsibility for the regional development of tourism are the regional councils, local authorities and Employment and Economic Development Centres (primarily their business services, rural services and employment departments). Meanwhile, the main actors in the private sector, other than the tourist firms themselves, are the Finnish Tourist Industry Association and other organisations such as the Association of Rural Tourism Entrepreneurs in Finland.

The development of tourism in Finland is governed by the government's decision-in-principle of 13th June 2001 entitled "Suomen matkailupoliittiset linjaukset" – Finnish tourism policy guidelines. This defines the most important policy areas, lists the principal measures to be taken and the authorities responsible for them and provides the public sector organisations involved with guidance on developing tourism as a business.

Quantitative and qualitative objectives for Finnish tourism policy up to the year 2010 are alo defined in the government decision, the priorities of the public sector in developing tourism being as follows:

1) to increase geographical and administrative cooperation
2) to enhance the impact of the public support provided for tourism
3) to increase investment in training and research
4) to promote access to tourism services through electronic distribution channels and to foster accessibility
5) to improve the quality of tourism services and promote activities in line with sustainable development.

RURAL TOURISM POLICY IN FINLAND[179]

Rural tourism is a form of entrepreneurship which is based on the intrinsic resources of the countryside: nature, scenery, culture and people. Its foundation lies in small family companies and a customer-driven approach. It can be manifested in many kinds of tourism services, provided that they are produced in the countryside, and may involve activities based on nature and culture, food and accommodation services, and holidays in the wilderness, on farms, in cabins or at campsites. By increasing development efforts both quantitatively and qualitatively, rural tourism could be made into a substantial source of employment and income throughout the Finnish countryside.

[179] www.mmm.fi

With the purpose of promoting the overall development of rural tourism, the Rural Policy of 1994 appointed a Theme Group on Rural Tourism with tasks related to strategy, collaboration, communication, efficiency in marketing, knowhow, stability and initiative. The group publishes the bulletin "Maaseutumatkailu" (Rural Tourism) and spreads information through other publications, the Internet, and postal or e-mail communications. Other highly visible activities include participating in negotiations, arranging lectures and workshops and adopting an active role in events related to rural tourism. The theme group has built up cooperation with projects supporting rural tourism and its development and has launched and guided many projects designed to back up this strategy.

The current ten-year vision for rural tourism in Finland states that at the end of the period the tourism industry in the countryside should be an active and important part of the tourism industry and a versatile form of rural entrepreneurship, but should be guided by the solid values of the countryside and the principle of sustainability. Rural tourism thrives on developing and selling competitive tourism and recreation services which are recognized as safe and reliable. The content and strengths of these services should emerge from the diversity of our cultural heritage, the cycle of the seasons, good quality, safety, a clean countryside environment and the competence of entrepreneurship in bringing these factors together. Sales and marketing of the services should be organized through close, efficient cooperation between local, regional and nation-wide operators. The services should be offered to the clientele under various themes, and the latest technologies should be put to use for sales purposes. The production chain in rural tourism should be characterised by constant improvements in competence.

RURAL TOURISM ENTERPRISES

According to a survey of rural tourism in Finland made by the Theme Group in 2002, most of the entrepreneurs involved are middle-aged, one fourth of them have tourism as their primary source of livelihood, and most of the enterprises (69%) are open all year round. The average employment impact of the firms was 19 person/months per year. 90 per cent of the enterprises offered accommodation services, 66 per cent programme services, 58 per cent food and 42 per cent meeting facilities. Most of the accommodation facilities were self-service cottages. Most of the entrepreneurs intended to invest further in buildings, two thirds in marketing and one third in programme services.[180]

According to a business sector report on rural tourism[181] published by th e Ministry of Trade and Industry, there are approximately 5 000 small enterprises offering accommodation, food and recreational services in the Finnish countryside. The number of actual tourism enterprises is less than 3 000, however, of which over 2 000 lie outside the official statistics. The combined number of rural accommodation firms counted as actual tourism firms increased by 6 per cent from 2000 to 2002, and their total revenue by approximately 5 per cent. The number of rural firms offering accommodation at the end of the year 2002 was 820, which is 56 per cent of all firms offering accommodation in the country. These rural enterprises are

[180] www.mmm.fi

[181] www.ktm.fi (tiedote 25.11.2004 Maaseutumatkailun toimialaraportti 2004: Maaseutumatkailu kiinnostaa ulkomaalaisia matkailijoita)

fairly small, however, and they account for only approximately 12 per cent of the total revenue from accommodation services and approximately 10 per cent of the total personnel employed. There is no reliable information on the success of the approximately 2 100 enterprises lying outside the official statistics. The year-round accommodation capacity of these firms is approximately 30 000 beds, equivalent to almost one third of the beds in hotels in Finland. The number of overnight stays by foreign visitors in rural tourism enterprises in 2003 is estimated to have been approximately 240 000, amounting to less than 10 per cent of all overnight stays, but the proportion of foreign visitors is increasing.[182]

3.1.6 Tourism in Central Ostrobothnia

Central Ostrobothnia is not one of the regions in Finland where tourism plays a significant role. According to a study of the impact of tourism on the regional economy, the direct revenue from tourism in 2000 was 37 121 000 euros[183]. There were 152 places of business in Central Ostrobothnia in 2002, and 471 people working in the hotel and restaurant sector[184].

There were 131 561 overnight stays at accommodation facilities in Central Ostrobothnia in 2003, and 78 526 arrivals. The proportion of foreign visitors was approximately 9 per cent of all overnight stays and approximately 8 per cent of all arrivals. The purpose of the visit was leisure for approximately 70 per cent of the visitors at all accommodation establishments in Central Ostrobothnia in 2003.[185]

Accommodation available in the region in 2003 consisted of 813 rooms/cottages and 10 hotels (of which 5 were in Kokkola), containing 937 beds (of which 652 were in Kokkola). The utilisation capacity of the hotel accommodation in that year was 27.7% (29.3% in Kokkola).[186]

A study of the regional distribution of work and responsibilities in tourism performed in 2004[187] showed the principal actors in tourism in Central Ostrobothnia, apart from pivate enterprises, to be the Regional Council, the subregions and local authorities, the Employment and Economic Development Centre, the Central Bothnia Rural Advisory Centre, Kokkola Tourism Ltd and an association known as Center-Botnia ry , also certain supra-regional and international networks such as Botnia Tour, Interreg IIIA Merenkurkku, FinWest and Pohjanmaan kautta. There is little cooperation between these actors, however, and the developing of cooperation between the subregions, for instance, is a great challenge. There is no permanent platform for cooperation, and the firms gave quite poor marks for cooperation beteen actors in the tourism sector in the region. The most important tasks for the public sector were considered to be the coordinating of cooperation, creationg of adequate operating conditions and the production of a common operational model that would serve as a general

[182] www.ktm.fi (tiedote 25.11.2004 Maaseutumatkailun toimialaraportti 2004: Maaseutumatkailu kiinnostaa ulkomaalaisia matkailijoita)

[183] Laakkonen 2002

[184] Statistics Finland

[185] Statistics Finland, SVT 2004

[186] Statistics Finland, SVT 2004

[187] Santala & Vesterinen & Moilanen 2004

strategy for tourism. Such a strategy was compiled in Central Ostrobothnia in 1996. According to the above study, there is only loose, random cooperation between firms, and a platform should be established for its improvement. The entrepreneurs wanted an up-to-date strategy and an actor capable of developing tourism regionally, as there is at present no regional coordination for product development and marketing.[188] There have been many projects related somehow to tourism, but many of them have been specific to a given subregion or municipality, for example, and have not covered the complete region.[189]

Another study suggested that most of the entrepreneurs in the tourism sector had participated in various joint projects in the region, and also in various kinds of regional or local cooperation. Many of these entrepreneurs thought that even more cooperation was needed, however, and that since tourism as an industry is new to the region, there should be new tourist attractions. In general, the entrepreneurs envisaged the situation in tourism in Central Ostrobothnia as likely to be better in the future than in present.[190]

Expectations relating to tourism in the region include programme services, bed & breakfast activities and extension of the tourist season, all of which are considered important for developing the tourism. One of the goals in the regional programme for Central Ostrobothnia is to increase the attractiveness of the region by exploiting the sea, archipelago, culture and history. With regard to farm tourism, the objectives are to increase the number of enterprises involved, developing attraction factors and exploiting the natural surroundings. Central Ostrobothnia has a strong cultural and musical tradition, and there is some tourism based on cultural attractions and events in the region. A good example is the Kaustinen Folk Music Festival, which attracts over 100 000 visitors a year. Folk music, handicrafts and folk medicine are matters which can be exploited economically in terms of developing means of livelihood in the rural areas of the region, and these can also be attraction factors in tourism.[191]

3.1.7 The electronics industry in Finland

Electronics and the electrotechnical industry consist of the production of electrical machinery and equipment, telecommunications equipment and electrical instruments. The sector expanded in Finland in 1990's in particular as a part of the ICT cluster[192], and its annual average the work force totalled 60 000 by the end of 2003. Employment in electronics and electrotechnical firms in Finland has decreased in recent times, however, while that in their overseas subsidiaries has increased, so that the total work force of the latter amounted to

[188] KTM 2002

[189] A tourism project called "Viksumpi" was commenced by Keski-Pohjanmaan Kulttuuriopisto in the Kaustinen subregion In October 2004, with the aim of developing the quality of tourism by means of a booking system, programme services and marketing. The project includes training and product development, for example (Keski-Pohjanmaan Kulttuuriopisto 2004).

[190] Liedes 2003

[191] Keski-Pohjanmaan liitto 2003

[192] Paija & Rouvinen (2004, 49) apply the porterian concept of cluster in the following: "A cluster is a network of organisations, public and private, in which competitive advantage grows from dynamic interaction between actors. Cluster relations disobey sectoral boundaries – they spur innovations and upgrade through spillovers and knowledge transfers. "

58 000 in the same year. About 80 per cent of the production is exported, so that the sector represented about 31 percent of all Finnish exports in 2003.[193]

The electronics and electrotechnical industry in Finland is specialised in the telecommunications sector, which expanded in the 1990s, largely on account of the adoption of the Nordic mobile phone standard at the European level and in other countries, the spread of mobile phones as mass products and the rise of Nokia as a major global force in this sector, although the longer-term national technology policy and development of the country's knowledge structure also contributed to the growth of the ICT cluster in Finland. National resources were mobilised in support of this growth, especially as a response to the economic crisis of the early 1990's.

The Nordic Countries have adopted a progressive attitude towards mobile communications. The first standard developed by the Nordic administrators and firms was NMT (Nordic Mobile Telephone), which was introduced in many other countries both in Europe and beyond. Based on the NMT concept, the GSM (Global System of Mobile communication), pioneered by Nokia and Ericsson, also matched the objective of the European Commission to provide comprehensive pan-European services and standards. It was GSM that provided the foundation for the growth of the Finnish ICT cluster.[194] After the mobile phone had emerged as a mass product, the volumes of telecommunications products rose sharply in of the late 1990s.

Historically, the Finnish ICT cluster has evolved around Nokia and strong telecom service providers. Nokia moved from cables, rubber goods and forestry to technology in of the early 1990s, when it began to be a global actor and opted for a global focus strategy. At this stage it concentrated on its core capabilities (Mobile phones, Networks), leveraging both units towards the forefront of the industry worldwide and divesting itself of all its non-core properties. To exploit this greater efficiency, Nokia coupled direct and indirect exporting with new modes of operation, such as licensing, subcontracting, contract manufacturing, partial projecting, turn-key projects and subsidiary operations of different types.[195]

The major processes in the evolution of the ICT sector were set in motion by public sector decisions, especially in the 1970s and 1980s, and when Finland went through a serious economic crisis in the early 1990's, a recovery strategy was chosen which included development of the ICT sector as a new growth area as well as re-industrialisation programmes and the modernisation of traditional industry. As a result, the industrial structure was radically transformed, mainly due to the emergence of diversified electronics.[196]

Many technology programmes and research programmes in the 1990 supported the development of telecommunications. The universities, polytechnics and research institutes produced advanced human resources and R&D for the use of the cluster, and the government was responsive to the demands of the ICT industry as to the content and volume of related

[193] Statistics Finland 2003, Teknologiateollisuus 3/2004

[194] Paija & Rouvinen 2004, Steinbock 2004, 43

[195] Steinbock 2004, 53

[196] Scienstock 2004

education. R&D cooperation between industry and the universities, both collaborative and outsourced, has been an integral part of this new technology development.

The ICT cluster that emerged in Finland during the 1990s, consisting of key industries, supporting and related industries, associated services and buyers/appliers (Figure 2), can be seen as the outcome of mutually enforcing dynamic relations between its actors, gaining global competitiveness through companies' specialisation processes. Nokia, as operators as well as digital content providers, belongs to the key industries, while content substance is created by the media and other related industries. Electronics in our case study belongs to the supporting industry part of the structure of the ICT cluster, a part that has become increasing specialised in serving the core companies. When Nokia divested itself of its non-core activities during the 1990s the role of the suppliers became more central to ICT cluster development. Finnish supplier products are typically highly customized, while, by using standard components, equipment manufacturers rely on imports from mass producers.[197]

Global growth in the demand for ICT equipment together with increased outsourcing have created a surge in the number of new suppliers, and tuned companies' supplies more directly towards the demands of ICT manufacturers. Globally operating customers have also upgraded the competence of their suppliers, while conversely, the strengthening of the scale and scope of the domestic supplier sector has provided a home-base advantage for Finnish ICT companies.[198] The contract manufacturers, EMS and ODM firms[199], and suppliers of parts and components are now expanding as a consequence of internal and external growth, in order to follow their leading customers onto foreign markets, particularly in China.

The contribution of manufacturing to ICT sector employment in Finland has been very high by Nordic standards (about 40%), while ICT goods accounted for about 20 per cent of total exports in 2001.[200] By 2002, Nokia Mobile Phones was operating 17 manufacturing facilities in nine countries and its outsourcing covered an estimated 15 to 20 per cent of this manufacturing volume. Nokia Networks has seven facilities, four in Finland and three in China, and over 60 per cent of its production was outsourced in 2002, in addition to some support activities.[201]

[197] Paija & Rouvinen 2004

[198] Ali-Yrkkö 2001, 16

[199] EMS = Electronic Manufacturing Services, ODM = Original Design Manufacturing

[200] Steinbock 2004, 75

[201] Nokia Annual Report 2003

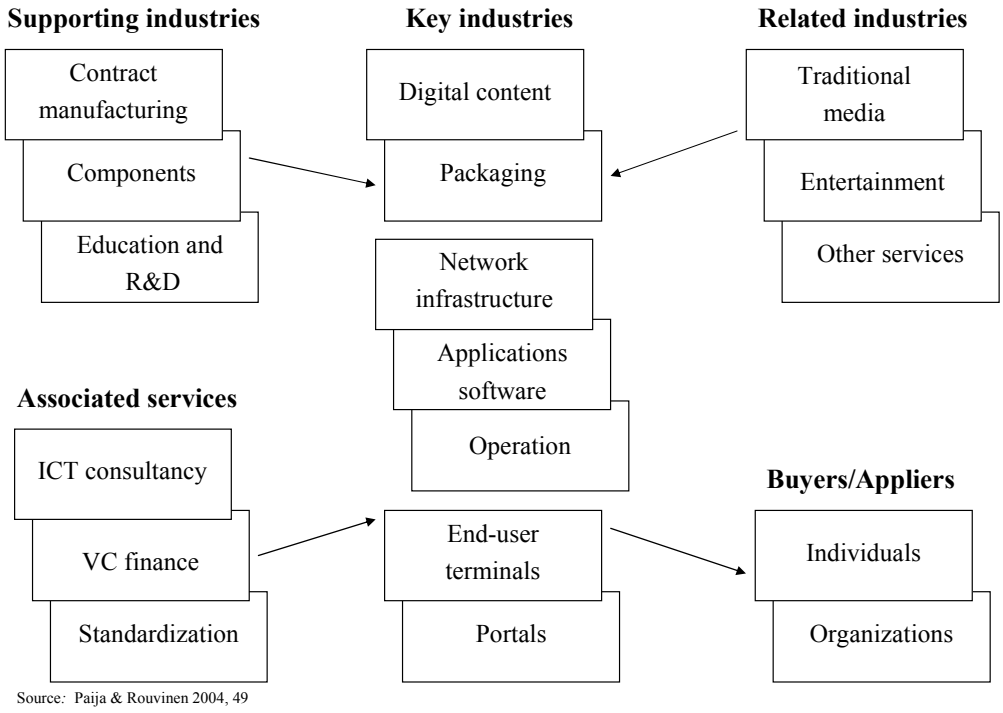


Figure 2 The ICT cluster in Finland

WINDOWS OF OPPORTUNITY: OUTSOURCING

As a nation, Finland has taken advantage of the windows of opportunity opened by the evolution of telecommunications and the emergence of network organisations, although these innovative opportunities have been mostly seized in the large urban areas. The ICT cluster is specialised in one sector (wireless telecommunications), and the window of opportunity for new entrepreneurship has been made possible by the expansion and outsourcing strategies chosen by the dominant firm, Nokia, which started to use more and more component providers and manufacturers in the late 1990s. This outsourcing was seen as an alternative to in-house manufacturing, and subcontracting and cooperation became more systematic as these activities becam a permanent mode of operation instead of a mean of stabilising the utilisation of the company's own production capacity.[202] As a result, Nokia has not integrated back into component production, but has relied instead on vertical coordination. It has independent basic technologies, but it is dependent on its suppliers. Due to the changing competitive opportunities in the wireless value chain, the role of these industrial participants, along with that of the operators, is critical to the firm's success.[203]

The growth of Nokia's production volume and outsourcing, together with the increasingly sophisticated needs of some other companies, has generated a growing number of new

[202] Ali-Yrkkö 2001

[203] Steinbock 2004

suppliers in Finland.[204] Specialised IT companies, known as system integrators, also form a part of the vertical production chain by providing compatibility and interoperationality among items of equipment from different vendor in a client technology environment.

As the global presence of suppliers has become increasingly important for efficient outsourcing, growth opportunities have been created for suppliers that are able to cope with rapid growth. Nokia has managed to secure an adequate inflow of components, even during global shortages, whereas the relatively small suppliers remain more vulnerable, due to relative differences in scale and scope.

Due to the high demand, shorter life cycles of products and increased weight of foreign sales, Nokia had to place more emphasis on logistics. There was an acute need to distinguish product life cycles from production equipment life cycles, and as a consequence, Nokia reorganised its supply chain and started to use assembler services more than before. EMS providers base their business idea on serving a large number of customers in varying industries and at varying phases of technology, applying the most advanced technology in forerunner sectors first and then gradually in other sectors. Thus, by pooling products from different generations of technology, EMS providers are able to prolong the service life of their production facilities. In this way, they have resolved the vendors' original problem, which is related to the mismatch between the life-spans of the products and the production technologies.[205]

EMS companies, or more generally sub-system suppliers, also serve to alleviate the co-ordination tasks of vendors by organising the suppliers of parts and components under direct management. This re-organising process has led to a reduced number of direct suppliers, because many suppliers have begun to deliver their products to the assembler or system supplier instead of to Nokia. In the production of telecommunications equipment, the role of Nokia is gradually tapering to that of the co-ordinator of a few key suppliers.[206]

REGIONAL DEVELOPMENT AND ELECTRONICS INDUSTRY

The ICT cluster was the economic engine of recovery from the mid-1990s onwards. Its development can be seen as a national recovery project, which involved all social groups from the national level down to the local level. Growth in the ICT cluster was concentrated mostly in the big cities, however, where the majority of new jobs were generated. The five largest: Helsinki, Tampere, Turku (and Salo), Oulu and Jyväskylä, grew in terms of population, production and employment in the years 1995-2001.

The co-operation network around Nokia has nevertheless also widened into some rural areas, where the partners are manufacturing firms producing components for mobile phone production and equipment for networks. These electronics firms have strong links to the urban areas.[207]

[204] Steinbock 2004, 86

[205] Ali-Yrkkö 2001, 46

[206] Ali-Yrkkö 2001

[207] Hautamäki 2000, Storhammar & Virkkala 2003

Historically, the development of the electronics industry in Northern Finland began when the large forest firms diversified into electronics in the 1970s, and the boom took place in 1986 and 1987. The firms were small, specialised ones in the cities of Oulu, Kajaani and Raahe, although there were also electronics assembly firms in Ylivieska, Sotkamo and Suomussalmi. Nokia expanded gradually in Oulu and it also expanded its R& D activities. The strengthening of the University of Oulu and the establishment of the Electronics Laboratory of the Technical Research Centre of Finland (VTT) there supported the emergence of a powerful electronics industry in the Oulu region. The ICT cluster expanded locally due to knowledge spill-over and the growing global market.[208]

3.1.8 The electronics industry in Oulu South

Oulu South is an agricultural and forestry area lacking the process industries, which have developed in many other localities, such as chemicals in Kokkola or pulp and paper factories almost in every region of Finland. Instead a certain number of small machine workshops have evolved in the region, and it also has a long tradition of handicrafts. There was flourishing textile industry there in the1970s and 1980s, but this collapsed in the early 1990s. (Figure 3)

The embryos of the electronics industry in Oulu South can be traced to the year 1963, when the motor enthusiast Esa Ojala founded Tehofilter Oy, to make filters for cars and heavy machinery. Later on the firm expanded and became the Ojala Group. The electromechanical industry began in Oulu South in 1976, when the Scanfil company was founded, producing thin metal plates and filters. The firm had many options for its location but decided to start production in this area because it had been offered it a suitable site, by the local authority of Sievi, which was active in supporting entrepreneurs, especially ones originating from the area..[209]

Scanfil and Ojala, remained locally owned family firms for a long time, and their success encouraged many other local people to follow their example. Scanfil was nevertheless still the leading firm in the region in 2004, acting as a telecommunication systems supplier and having many local firms as subcontractors. It is now quoted on the Helsinki stock exchange but still has significant local ownership and retains its headquarters in the area.

Apart from engineering works serving the mechanical wood-processing industry, Oulu South has traditionally had mostly small machine workshops, some of which acted as subcontractors for Nokia and ABB in the 1980s and early 1990s. The expansion of the ICT sector, and especially outsourcing from Nokia Networks, gave an external growth impulse to the small workshops in the region and created opportunities for new companies. Many machine workshops changed their line of production to electronics and electromechanics during the 1990s, and Scanfil and Ojala were able to benefit from the growth of Nokia Networks so that they gained a key position in the electronics business in this area. Other firms grew in tjheir role as subcontractors, seizing the opportunity created by the growing cluster. The emergence

[208] Männistö 2002

[209] Hautamäki 2002, 58-76

of electronics in the area was supported by local industrial policy, especially through the provision of new buildings on industrial estates, and the local educational institutions were able to respond to the needs of this new sector by the late 1990s.

Thus Oulu South is now geared to supplying the electronics industry, possessing about 35 firms specialised in certain branches of electronics and electromechanics, especially "thin plate mechanics" and employing about 2000 people. Their products go mainly to companies in Oulu, as they are mostly contract producers, component producers or production planning (RF) enterprises in the business-to-business markets of wireless communication technology. The industrial network is localised and consists of many layers.

The rural electronics and electromechanics manufacturing firms are in the end of this multi-layer production chain, and have thus been affected by the cyclic fluctuations in the demand situation and in the fortunes of the industry's clients.[210]

[210] Antinoja & Hakuli 2003, 25

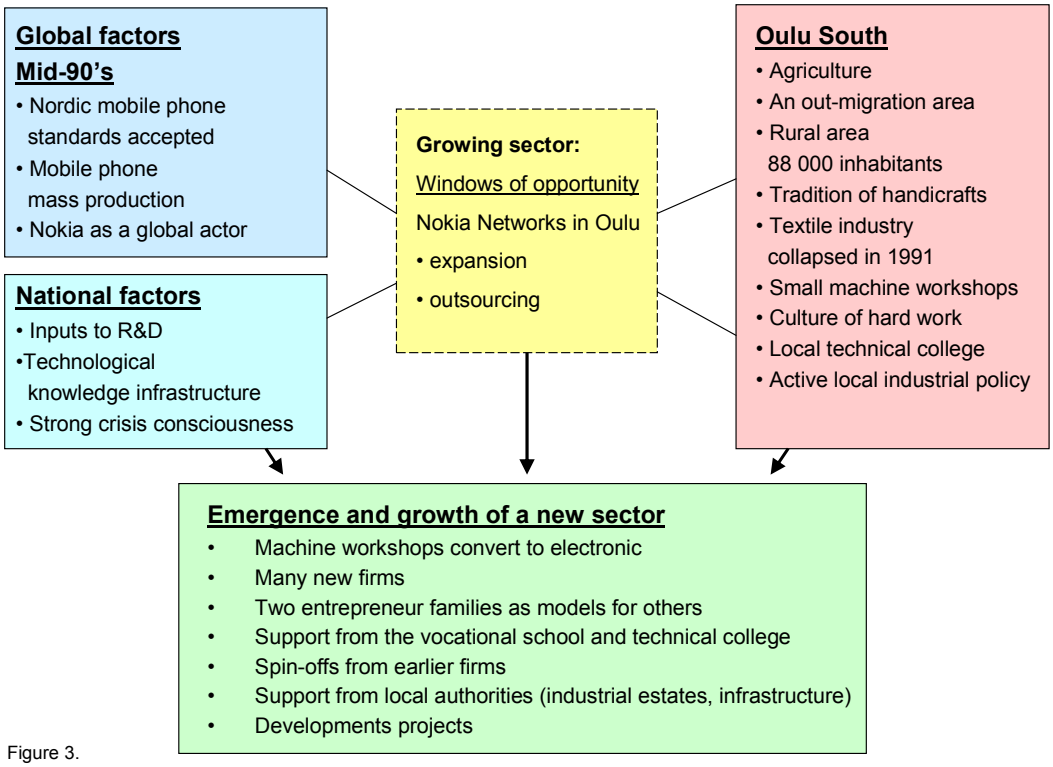


Figure 3.
The emergence and growth of electronics in Oulu South

3.2 Selected issues in policy and institutional initiatives

3.2.1 From technology policy to innovation policy?

BACKGROUND

Technology policy has been more on the agenda in Finland than has innovation policy, and has been developed along three main lines: scientific research, university education and connections with industry.[211].The institutionalisation of science and technology policy can be dated to the early 1960s, when higher education and science policy became more closely coupled with industrial and regional policies and were strengthened by the establishment of new universities in various parts of the country.

The national technology agency Tekes, established in 1983, developed into an important instigator of public R&D in the country, and immediately adopted information technology as its area of focus.[212] Alongside this, Finland's first technology park was opened in Oulu in 1982, and strong regional and political support emerged for the creation of others on the same lines. Technology transfer and the commercialisation of research results gradually gained more attention in the Tekes technology programmes as well.

Systemic policy making was consolidated in Finland in the 1990s. The policy makers and planners seem to have adopted a broad approach to industrial policy and to have viewed technology policy as a central component of it. This technology policy came to touch upon the goals and activities of society as a whole and played an important in the adaptation of industrial policy[213] in the early 1990s from a scheme of direct subsidies for firms and regional and sectoral subventions to an industrial strategy, the goal of which was *"not the reallocation of resources but rather influencing the quantity and quality of the resources to be created in the future.*"

These new guidelines for industrial policy promoted a radical transformation in the industrial structure,[214] mainly due to the emergence of a diversified electronics industry. Finland's economic specialisation shifted towards knowledge-intensive high-tech industries, and away from raw material, energy and capital-intensive industries.[215] Finnish technology policy has been essentially a national project, and its justification has rested on its alleged positive impacts on welfare and development in society at large.[216]

A NATIONAL INNOVATION SYSTEM

Even if the concept "innovation policy" has not been so much on the agenda, that of a "national innovation system" has been an important framework in planning of the country's

[211] Oksanen 2003

[212] Oksanen 2003

[213] Jääskeläinen 2001

[214] Oksanen 2003

[215] Schienstock 2004

[216] Oksanen 2003, Castells & Himanen 2001

science, technology, industrial and other policies.[217] This has developed into a more comprehensive approach which looks at the producers and users of knowledge as an entity.

"*The national innovation system means a comprehensive entity composed of the producers of new knowledge and know-how, their users and the various ways in which these interact. Central elements in the innovation system are education and training, research and development, and knowledge-intensive business. New knowledge is produced by universities and polytechnics, research institutes and businesses, among others. Knowledge is chiefly used by businesses, private individuals, and the decision-makers and administrations responsible for the development of society*." [218]

This formulation assigns to science and technology policy the central task of ensuring balanced development of the innovation system and of promoting cooperation within it, although the policy documents also recognise the importance of collaborative relations with other sectors of society, such as economic, industrial, labour, environmental and regional policy, social welfare and health care, which are seen to create the prerequisites for knowledge-based development.

The national science, technology and innovation policies are formulated by the Science and Technology Policy Council, which works under the Prime Minister. The organisations with primary responsibility for science and technology policy are the Ministry of Education, which is in charge of matters relating to education and training, science policy, institutions of higher education and the Academy of Finland, and the Ministry of Trade and Industry, which deals with matters relating to industrial and technology policies, the National Technology Agency (Tekes) and the Technical Research Centre of Finland (VTT). Nearly 80% of the government's research funding is channelled through these two ministries.[219]

TECHNOLOGY POLICY AND THE NATIONAL TECHNOLOGY AGENCY TEKES

Technology policy is aimed at developing a national innovation system with a view to generating new knowledge and promoting knowledge-based production and services. The majority of the technology financing goes through the National Technology Agency (Tekes),[220] which provides subsidies and loans to finance technology projects to be carried out by companies, research institutes and universities through the medium of the technology units of the Employment and Economic Development Centres in different parts of Finland.

Technology programmes are means by which Tekes can make strategic choices and steer priorities in order to promote development in specific sectors of technology or industry and to pass on the results of research work to industry in an efficient way. The programmes promote cooperation and networking between companies, universities and research institutes, strengthen technology transfer and support international expansion. The focus has been on

[217] www.research.fi/index_en.html

[218] Seppälä 2002

[219] www.research.fi/index_en.html

[220] The Ministry of Trade and Industry's administrative branch will spend a total of 526 million euros on research and development in 2004. (www.ktm.fi)

key technology sectors such as Information and Communications Technology, Biotechnology and Chemicals Technology.[221]

The technology programmes have proved to be an effective form of cooperation and networking for companies and the research sector,[222] with 1600-2400 businesses and 700-900 research units participating in them annually. In autumn 2004 there were 24 ongoing programmes of this kind, totalling 1.3 billion euros. Approximately a half of Tekes' R&D funding each year (180 million euros in 2003) is channelled through these technology programmes, which have contributed greatly to the development of many new products and processes. [223]

The work of Tekes is looked on nationally as a success story, because the results of its R&D investments have contributed to the structural change in industry and increased Finnish high-tech exports. The electronics and electrical industry now represents the third strongest supporting arm of the Finnish economy, alongside the forest industries and the metal and engineering industries. Tekes' role is to ensure the competitiveness of the country's traditional industrial clusters and at the same time to create and oversee the growth of new industry.

Although the official line is that the policy sectors developing the Finnish innovation system include technology policy and science policy, the concept of innovation policy is used quite inconsistently and some of the official actors in the national innovation system are not in fact articulating innovation policy. They may use the concept, but its content seems to be the same as that of technology policy.

The general objective of the Ministry of Trade and Industry technology and innovation policy guidelines for 2004-2007 is to promote economic growth and the competitiveness of Finnish industry, and to promote employment and enhance welfare[224]. Although the articulated aims are still very much pointing along the accepted science and technology policy lines, e.g. the desire for an innovation climate that is attractive to foreign R&D investments, the guidelines also mention the renewal and strengthening of Finnish industry and improvement of the regional actors that are able to utilise R&D knowledge. [225]

In our opinion, these science and technology-based innovation concepts serve as very strong preconditions and mental models when formulating policies for a national innovation system in Finland. The broad concept of innovation, as used in the ISP project, which emphasises the synthetic aspects of knowledge bases and innovations, is marginal to the Finnish policy of developing a national innovation system, as the concept of innovation implicit in these policies is not a linear one but rather a systemic one. In fact, according to the evaluators, the basis for the system lies in smoothly functioning interaction.

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[221] www.tekes.fi 2004

[222] The largest ongoing programmes in 2004 wre those for the Miniaturization of Electronics - ELMO, Networks of the Future- NETS, Interactive Information Technology - FENIX, FinnWell, Drug 2000, Novel Biotechnology - NeoBio, a Technology Programme for Mechanical Engineering – MASINA, and DENSY - Distributed Energy Systems.(www.tekes.fi)

[223] www.tekes.fi

[224] www.ktm.fi

[225] www.ktm.fi

Although the strong emphasis on science and technology policy and the weak emphasis on innovation policy create a situation which differs from that in the other Nordic countries, some of the measures regarded as innovation policy in other Nordic countries seem in Finland to be part of industrial policy. In any case, innovation policy as it affects low-tech industries or peripheral regions inevitably lies in the shadow of the hegemonic technology policy directed towards the high-tech sectors of society.

Efforts are being made to move from a technology policy focusing on knowledge, skills and R&D towards a broader innovation policy that is integrated into other sectors such as educational policy. According to Honkanen and Lemola (2004), this effort needs broad research into innovations and an integrated policy. The new policy is being outlined in a major research programme ProACT.[226]

REGIONAL INNOVATION POLICY

Regional innovation policy can be seen as a field of innovation policy, but it is more often looked on in Finland as a matter of regional development policy. The regional perspective was introduced into innovation policy in the 1980s and was strengthened in the 1990s. The network of higher education institutions, technology centres, centres of expertise and other operational factors has promoted innovation specifically in the regions, and thereby the emergence of a regional innovation policy.

The core of current regional innovation policy is formed by the national Centres of Expertise Programme, first launched in 1994, with a second period in 2000, extended to 2002. It is due to run until 2006. Altogether 22 centres have been named for the period 2003–2006, four of which operate on a networked basis.[227]

The Centre of Expertise Programme is an umbrella-like instrument for assisting regions in targeting resources to areas of activity which can be defined are strategic. Its mission is to utilise international high-level knowledge and competence, to improve the development resources of the regions, and to create new employment opportunities. The national programme supports regional specialisation and cooperation between the centres.[228]

The regional Centres of Expertise are also important co-operation channels for the research institutes. Most of the regional actors such urban councils, universities, associations and enterprises participate in the activities of these centres, and their project funding comes from different sources, including Structural Fund programmes and national technology programmes. The Centre of Expertise programme is seen as a national instrument for channelling EU funding into regional development.

The Centres of Expertise are located in the major cities, but some of them have also impacts on the surrounding rural areas. In our case study area, Kokkola has a Centre of Expertise in chemistry and the actors in Oulu South are involved in two networked centres of expertise: that for the metal industry in the Bothnian Arc (Prometal) and the Multipolis network. Prometal involves the production studios of three localities in Northern Finland, Nivala, Raahe and Tornio, various firms and the University of Oulu, while the Multipolis network,

[226] http//proact.ktm.fi, Honkanen & Lemola 2004

[227] www.intermin.fi

[228] www.intermin.fi

launched in 1998 with the objective of expanding the technology-related expertise and knowledge of the Oulu urban region to other areas in the north and approved for the national programme of centres of expertise in 2002, now connects 15 specialised spatial clusters of technology enterprises and expertise in this part of the country. One of these is RFM-polis, located in Oulu South, which is specialised in wireless telecommunication technology and digital media.[229]

Technology policy is implemented at the regional level by the Employment and Economic Development Centres (T&E Centres), which coordinate the regional technology strategies, including their technology policy objectives and measures. Their technology units are the main sources of finance at the regional level.

The Ministry of Trade and Industry guidelines for 2004-2007 emphasise the improvement of the ability of regions to utilise R&D knowledge by making better use of the expertise available at the institutions in the technology sector, by strengthening the resources of the technology units at the T&E Centres' and by promoting measures aimed at introducing and applying new technologies.

With the continuing tendency to regionalise innovation and technology policy in Finnish society ,it is likely that the programme of centres of expertise will be strengthened in the future and the national technology programmes will probably be broadened and opened up to firms and actors in more peripheral regions and in low-tech branches. There are trends towards regionalisation of the activities of the actors in technology and innovation policy, in view of the existence of a decentralised university system and a wide regional polytechnic network.

UNIVERSITIES AND POLYTECHNICS IN REGIONAL DEVELOPMENT

Educational policy has been one of the most influential instruments of regional policy in Finland, which has traditionally aimed at both regional and educational equality. The establishment of new universities in the 1960s and 1970s and the development of the decentralised university system has influenced regional development, one well-known example of this being the influence of the University of Oulu on development in the Oulu region. The universities and polytechnics are still seen as the engines of development in a Finnish context.

One of the main aims of Finnish educational policy has been to improve the level of education throughout the country, offering further studies for all school-leavers and higher education for two thirds of every age group i.e. entrance to a university or polytechnic is offered to about 50 000 students per year, where the average age cohort is about 64 000.

The higher education system consists of two kinds of institution: practically oriented polytechnics (non-university sector) and universities engaged in teaching and research in the sciences and arts (university sector). These systems also have different "owners", as the university system belongs to the domain of the state and the polytechnics to that of the local authorities and joint educational boards formed by these. [230]

[229] Multipolis 2004, www.elsi.net.polis.fi

[230] Ministry of Education 2000

Finland has 20 universities – ten multi-faculty institutions, six specialist institutes and four academies of the arts - all of them engaged in both education and research. They are located in all the major urban areas, and many of them have satellites in smaller centres. Six of these satellites, in Pori, Lahti, Kajaani, Seinäjoki, Mikkeli and Kokkola, were granted the status of a "university consortium" in 2004. This mean that Central Ostrobothnia has one of these consortia, the Chydenius Institute in Kokkola, providing education and research under the joint auspices of the universities of Jyväskylä, Oulu and Vaasa. In addition, there are numerous smaller university satellites located elsewhere, including more than ten run by the University of Oulu in Northern Finland One of these is the Oulu South Institute, established in response to local initiatives in 2003.

The polytechnics were established in 1995 as a result of a major reform aimed at raising the standards of education, responding to the needs for decentralisation and regional development maintaining closer connections between education and industry. The reform was a national project, but it followed the European trend towards the expansion of higher education and resembles the corresponding German and Dutch institutions. The polytechnic reform altered the status of the earlier sectoral institutions such as technical colleges, which did not have any special regional orientation, and it was also a curriculum reform, entailing revision of the structure and content of the qualifications provided. [231]

The 29 polytechnics in Finland provide education, predominantly in technology and commercial studies, in over 80 locations throughout the country and have more than 250 previous institutions integrated into them. These regionally organised institutions are required be flexible in order to react to regional development needs and industrial change,, and increase in importance in the regional networks if there is no university-level teaching or research available in their fields.[232]

The network of higher education units consists of 58 institutes, which are highly decentralised,, so that the whole country is integrated into institutions of higher education and research by virtue of their satellites. These higher education units are small and are organised on the networking principle.

According to the Science and Technology Policy Council of Finland (2003),

"The role of universities and polytechnics in regional development will grow, as will the importance of their good cooperation in the regions. This is a question of merging national higher education policy and regional development policy together."[233]

3.2.2 Regional policy: from state policy to multilevel development policy

The traditional policy sectors affecting regional development have been agriculture policy, industrial policy and regional policy. After World War 2, agricultural policy was aimed to ensuring adequate conditions for agricultural production, and industrial policy at promoting industrial growth. Thus industrialisation was state-led. Regional policy has been divided into

[231] Kekkonen 2004

[232] Kekkonen 2004

[233] Science and Technology Policy Council of Finland 2003, 41

"small-scale" and "large-scale" categories, where the former refers to regional policy measures and the latter to the regional effects of other policies.

State industrialisation and the building of the welfare state served to reduce the polarisation caused by the structural changes in production in the 1960's and 1970's. The state provided compensation for the disadvantages of peripherality by redistribution, giving all parts of the nation the same status and all citizens the same nationally organised services wherever they might choose to live. In this way the regions developed as integrated parts of the national project, and thus the state attained a powerful legitimacy as the central actor. "Small-scale" regional policy was aimed at the mobilisation of resources and economic growth, while the "large-scale" policy brought national integration, equalisation of welfare differences and improvements in the accessibility of services.[234]

Regional policy was thus aimed at integrating the Finnish territory into a homogenous entity and may be said to have developed in 3 phases:

- Regional industrialisation policy, 1960's and 1970's.
- Regional welfare state policy, 1970s and 1980's.
- Programme-based regional policy, late 1980s and 1990's.[235]

Efforts were made in the 1980s to shift the emphasis from "hard" to "soft" regional policy, emphasising not only investment in hardware but also the development of knowledge and networks. Regional development programmes thus took the form of programmes for regional centres, regional technology programmes and structural change programmes, for example. Subsidies to companies still exist on regional basis, although these are now directed specifically towards research and development activities. Such measures have succeeded in quickening the pace of structural change in the regional economies (and also nationally) from a resource-based to a knowledge-based economy.

Until the economic crisis of the early 1990s, the need to combine regional equality with macro-economic efficiency was central, but this crisis increased the emphasis on macro-economic objectives and this in turn led to a decline in the level of resources allocated to the public sector.

Since 1995 the core of regional policy has consisted of the implementation of Structural Fund programmes, which has indeed become the dominant mode of operating in all aspects of regional development. The mechanisms of regional development are changing from those of a redistributive system to those of a system based on the absorption ability of the regions. The aim is to promote indigenous development of the regions as well as their balanced development. National policy and EU regional policy are considered to be as one, with the aim of supporting the development of different parts of the country. National regional policy has been implemented in the form of various programmes such as the Centre of Expertise programmes, Rural programmes, Urban programmes and Regional Centre Programmes , and its aims will be achieved through these programmes and through national subsidies to companies based on a regional division. Regional development policy is generally aimed at

[234] Virkkala 2002a

[235] Vartiainen 1998

supporting economic growth, generating new firms, improving employment levels, creating a more efficient infrastructure and allowing efficient mobilisation of resources.

The Structural Funds have been more important in Finland than in Denmark or Sweden, as about 60 per cent of the population live in the Objective 1 and Objective 2 target areas. Areas eligible for Objective 1, which promotes the development and structural adjustment of regions whose development is lagging behind, are defined as having a per capita GDP less than 75 per cent of the EU average, and about 21 per cent of the population in Finland are living in such areas. Similarly, 31 per cent live in areas that qualify for Objective 2, which is intended to support the economic and social conversion of areas facing structural difficulties. Projects implementing these programmes are required to operate on four principles: concentration, partnership, added value and programme orientation. In addition to these Objective programmes, many areas of Finland are engaged in the EU Community Initiatives aimed at promoting innovative operation. Leader + is a Community Initiative targeting rural development.[236]

Four regional Structural Fund programmes are being implemented in Finland during the period 2000-2006: Objective 1 Northern Finland, Objective 1 Eastern Finland, Objective 2 Western Finland and Objective 2 Southern Finland. Our case study areas belong to the Objective 1 Northern Finland and Objective 2 Western Finland programmes.

The aims of the Northern Finland Objective 1 Programme are to increase economic growth in that region and to create new entrepreneurship and new jobs, thus arresting depopulation by improving sources of livelihood and the quality of life. The strategy is to improve the growth potential of existing enterprises and to create the prerequisites for the establishment of new ones. Priority is given to business activity, rural development, expertise and employment. [237]

The development strategy in the Western Finland Objective 2 Programme is to increase entrepreneurship and jobs and improve the competitiveness of business, agriculture and forestry by raising the level of expertise. The strategic emphases and mainstreaming principles are expertise, employability, promotion of the information society, urban-rural interaction, local culture, internationalization, equality and sustainable development. The three priorities which form the key to the implementation of the programme are the developing of business activity and renewal of the industrial structure, the developing of an expert workforce and the related technology, and the ensuring and reforming of the basic infrastructure.[238]

The Finnish administrative structure is characterised by two poles: a strong central state administration on the one hand, and the local authorities with an extensive measure of autonomy on the other. Finland does not have elected county councils , but instead both the state administration and the local authorities operate at the regional level in economic development issues (Figure 4).

The local authorities are important actors in rural development and have also been active in matters of industrial policy. Networking among them is also common enabling them to build

[236] www.intermin.fi

[237] Ministry of the Interior 2001

[238] Ministry of the Interior 2001

sub-regional units which occupy the ground between the local government and regional levels. The Regional Councils, which act as regional development authorities, are also in effect joint municipal boards, as the local authorities send their representatives to the regional board, which is the executive body of the Regional Council. The Regional Council draws up a regional plan and regional strategic programme that outline the aims of regional development.

The state operates at the regional level through the Regional Employment and Economic Development Centres (T&E Centres), which have offices for business services, employment services and rural services. The majority of the regional development funding from the state budget is allocated through these centres, and they also play an important role in managing many projects co-financed by the EU Structural Funds.

The local development projects are owned and initiated by local authorities or joint bodies set up by these, by regional or local development agencies, by educational institutes, by technology centres or by other local actor, while the Regional Councils mostly co-ordinate the regional development programmes and projects, and also initiate some development projects. The Regional Councils also have some resources to allocate to the projects that implement regional programmes, but the majority of the project funding and the subsidies for rural firms are allocated by the T&E Centres.

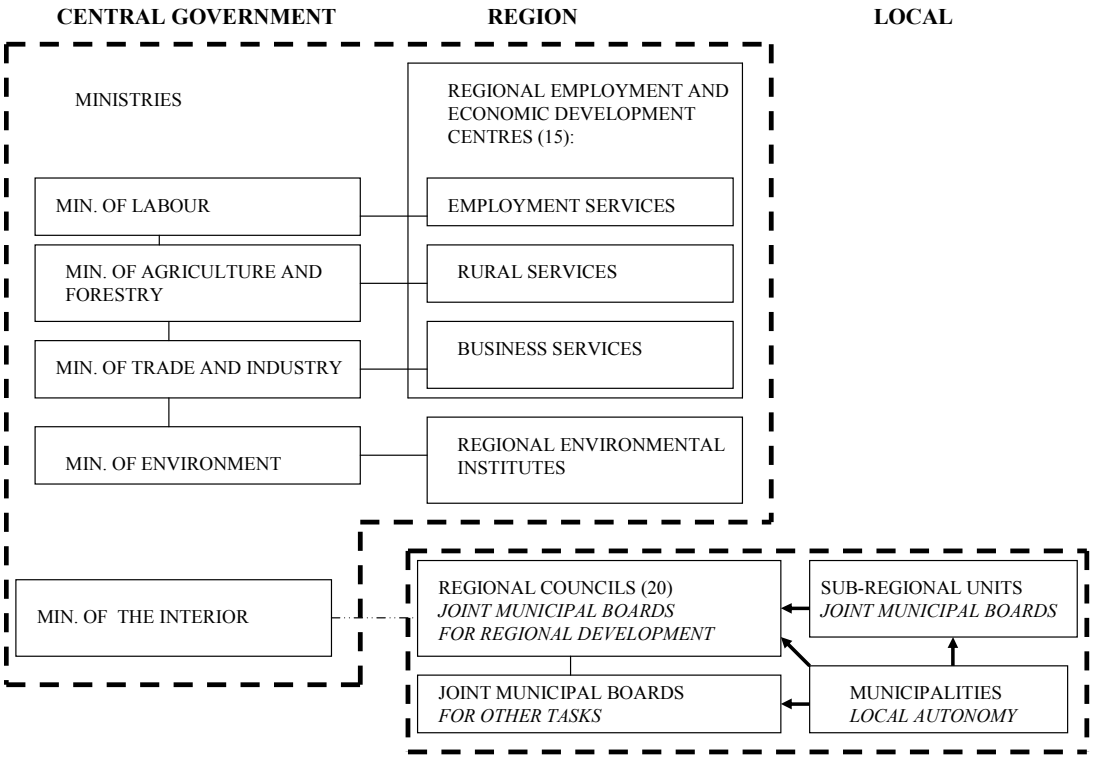


Figure 4. The administrative structure in Finland at the central government, regional and local levels

3.2.3 Rural development policy

Although regional and agricultural policy previously had rural development elements, but rural policy in Finland was established as a policy sector only in the late 1980s and strengthened in the 1990s. Rural policy developed as a response to structural changes in the rural areas as primary production was declining as a source of livelihood and out-migration was growing. Similarly the effects of sectoral policies based on the notiomn of efficiency often had cumulative negative effects from the point of view of rural areas. Rural policy was needed as a precision weapon for counterbalancing purposes. The countryside was regarded as a thing of value in itself and as a resource for development which has a lot to offer of its own in terms of social policy.[239]

Rural policy applies to various levels, concerns both private and public organisations and may be based on either formal or informal structures. At the national level the main actor is the Rural Policy Committee, which is a multisectoral forum for administrative partnerships. It is intended as a means of collaboration between different sectors of the administration, a forum in which experts from nine ministries and expert organisations or interest groups endeavour to find joint solutions to problems that are common to all, even if they may be marginal to some sectors. The policy is planned in the course of large-scale horizontal national rural development programmes, the first of which was implemented in 1991-95, the second in 1996-99 and the third in 2000-2004. The third Rural Policy Programme was in line with the theoretical precepts of European rural policy, with central emphasis on the integrated rural policy paradigm. The fourth programme "Vital countryside – our common responsibility", for the years 2005-2008, was in the process of formulation by the end of 2004. These national rural policy programmes consist of about 100 concrete proposals (suggestions for measures), some of which need additional money. It is anticipated that most of them will be implemented in the course of time.[240]

Rural policy has been structured around five permanent priorities: reform of economic activities in rural areas, development of know-how and human resources, strengthening the existing service network, development of the quality of the residential environment and community structure, and sustainable utilisation of natural resources. The means available for its implementation in 2000-2006 consists of the EU Objective 1, 2 and 3 programmes, the rural development programme, the LEADER+ Community Initiative, local action groups based on national funding and the theme and work groups of the Rural Policy Committee. Some of the work groups function on a fairly permanent basis, e.g. Food Finland and those concerned with rural tourism, telecommunications, remote rural areas and rural women. These work groups are responsible for the long-term development of their themes and provide surveys and accounts of certain issues at short notice. The national theme groups will have more activities at the regional level in the new period, including work programmes, theme programmes, umbrella projects and coordinator activities in different fields.[241]

[239] Hyyryläinen & Uusitalo 2002

[240] Countryside for the people, Rural Policy Committee 2000

[241] Countryside for the people, Rural Policy Committee 2000

The differences between the rural areas play a central role in rural policy, since the main emphasis in the remote areas is on their particular strengths, while close to the population centres efforts are made to increase interaction with the urban areas.

The local authorities were for a long time important actors in rural development policy at the local level, their most significant functions being in the fields of education and culture, health care and nursing, social welfare and planning. The local authorities are in fact responsible for almost two thirds of all public services.

The other local actors are the villages and village action groups. The village is not an administrative unit in Finland, but a village movement has spread through the country since 1970s and has become a part of the development of civil society in the countryside, incorporating the tradition of voluntary work. Village committees are voluntary groups constituted in a manner agreed on jointly by the inhabitants themselves that can act as planners of development programmes and assume part of the responsibility for the implementation of village projects.

Before Finland joined the EU the development work that took place in rural areas was mostly governmental, but there is now a shift going on from the local level to the sub-regional level in the rural development policy. The rural districts have adapted to the EU, and local action groups marked a new era in the local development policy, serving as the main actors in the LEADER programmes and in the POMO programmes which are a national application of the same idea. The local action groups have their traditions in the village committees, but they have also mobilised new groups of people in the cause of rural development. There are 58 local action groups in the 419 municipalities in Finland.[242]

3.2.4 Linkages between innovation policy and rural development policy

Since the regional centres of expertise are mostly located in the larger urban centres, the considerable number of firms operating elsewhere are in a marginal position as regards the mainstream of the national innovation policy, the main instrument of which is the technology policy. These firms are either too small or they have too little in the ways of resources to participate in the large national technology programmes which are managed and funded by Tekes.[243]

Tekes itself is anxious to point out that strengthening of the growth centres can be of benefit to everybody:

"*Growth centres generate job opportunities and growth while also increasing the opportunities for success in the surrounding regions. They create wealth that can also be transferred to less developed regions through wealth redistribution systems.*"

"The aim of technology policy for specialised growth centres is to safeguard the region's international competitiveness in its key fields of knowledge and skills, and closely related fields, and acquire other leading knowledge and skills for the growth centre through networking. The growth and wellbeing of regions outside growth centres is ensured mainly by

[242] Hyyryläinen & Uusitalo 2002

[243] Storhammar & Virkkala 2003

other means, rather than through technology policy. The aim of technology policy is to network players located in these regions with national networks of knowledge and skills, which are mainly based on growth centres." [244]

Improvement of technological skills and R&D projects have been important in Finland because they have seen as the basis for long-term success in the regions. Both the Objective 1 and Objective 2 programmes have provided resources for SME software investments in their target areas and contain many priorities for improving innovation conditions, especially the local milieu of rural firms. According to the evaluation of these programmes, the Structural Fund resources have improved the technological level of the target areas, but inside the areas the subsidies are concentrated in the centres. The reason is that there are no project owners in peripheral sparsely populated areas and only a few possible applicants.[245]

A large proportion of the resources allocated under the national technology policy have been directed to the major urban areas, which in our opinion means that technology policy has promoted economic growth but has also accentuated the spatial polarisation between the large urban centres and the other parts of the country.

The rural policy programme for 2001-2004 "Countryside for the people – rural policy based on will", prepared and coordinated by the Rural Policy Committee, have also proposals relevant to innovation policy, e.g.

- Development of an environment for innovation in rural areas. The whole education chain from basic education to polytechnics and universities should be committed to close cooperation for the development of economic activities in the region concerned.
- Modern information technology should be available for everybody. In the information society equality also means that the cost must be the same for everybody.
- Diversification of rural industries is a prerequisite for maintaining the viability of the countryside. [246]

One concrete measure in the programme was to launch a national programme of small rural specialised expertise centres. The government decided, however, to strengthen the national programme of expertise instead, in order to launch a new rural policy innovation programme in spring 2001.[247] The national programme of centres of expertise includes some rural locations, although the centres are mainly located in larger urban areas.

3.2.5 The official framework for business services and innovation facilitation in the case study regions

The core circle of the public sector business service system is formed by over 20 organisations that provide advisory, development, financing and consultancy services for

[244] Tekes 2003, 21, www. Tekes.fi

[245] Kuitunen & Oksanen 2002

[246] Countryside for people, Rural Policy Committee, 7

[247] The Minister of Finance rejected the rural policy innovation proposal because it would have distributed the resources in too many places, and it was no longer included in the government's decision-in-principle of the 5th April 2001 on rural policy.

enterprises and entrepreneurs starting up a business at more than thousand service points in Finland.[248] The public system of business services consists of three parts: Business development and financing services, research and development services as well as authority services[249]. Figure 5 represents the two first mentioned parts of the public business services system in national, regional and local level in Finland.

There is a number of support mechanisms providing assistance to SMEs in terms of finance as well as via free or subsidized business services. **Finnish Industry Investment (FII)** is a state-owned equity investment company. FII invests in three types of funds targeted at financing companies in different growth phases. Private equity funds target later growth state companies, including corporate restructuring. Venture capital fund investments target early and initial growth state companies. Regional funds target companies in various growth stages in the fund's region. **The Finnish National Fund for Research and Development (Sitra)** is an independent public foundation under the supervision of the Finnish Parliament. Its business financing is divided into four areas: technology, life sciences, regional operations and early stage SMEs. Its venture capital operations focus on start-up companies, companies in the phase of product development, and especially on "innovative technology companies". **Finvera Plc** is a state-owned specialised financing company and Finland's official export Credit Agency. Finvera's business financing includes loans, guarantees and export credit guarantees. It has regional offices.[250]

FII, SITRA and Finvera Plc are mainly financing the business, but T&ECentres, Tekes, FFI and Finpro are providing also business support services other than direct financing.

Employment and Economic Development Centres (T&E Centres) are the main regional organisation providing services for general business development needs, both during start-up and growth as well as for organizational development. A network of 15 regional offices with business departments, whose main task is to serve the needs of SMEs by providing business support services, consultation and advice, as well as finance. T&E Centres provide advice for various business needs and can help businesses in finding the right services and funding to each particular case. Furthermore, they offer subsidized business development services, outsourced from private consultants. The T&E Centre provide subsidies through the EU Structural Fund programmes.[251]

Tekes is the main financing organisation for research and development (R&D) in Finland. Tekes' services are available via the network of the T&E Centres. Tekes has a staff of over 200 people at the headquarters, and 56 technology agents at the T&E Centres, and it uses some 45 outsourced managers for its technology programmes. Tekes offers a range of support funding and services for SMEs and large firms R&D, especially when related to new technology. Tekes' TULI-programme provides support for the mapping, evaluation, and development of researchers' business ideas related to technology. The LIKSA programme is offered in cooperation with Sitra, and provides assistance in the initial phases of technology

[248] Kauppa- ja teollisuusministeriö 2004

[249] Authority services means the services of customs, taxation authorities, work protection authorities etc.

[250] In the case study region region this type of fund is Wedecon in Central Ostrobothnia and Jokilaaksojen rahasto (Technoventure management) in Oulu South.

[251] Väänänen 2003

start-ups. Both of these programmes involve support services that are provided by technology centres and technology transfer companies in Finland. SMEs can participate in Tekes' technology clinics where firms get assistance in gaining access to research results and expertise from Finnish universities and research institutes. Tekes organizes technology programmes in selected strategic areas.[252]

Innovative start-ups, based on inventions or new technology, have access to the services of the FFI and Tekes. These organisations are specialised in supporting innovative firms and R&D, Tekes at R&D intensive SMEs and large firms.

Foundation for Finnish Invention supports and promotes Finnish inventive work and the development and exploitation of invention. It has, however relatively small financial resources.

Finpro is an expert service organisation, partly financed from public funds, providing business services for internationalisation. In 2002, it had about 4 800 companies or organisations as its clients. Over 60 percent of its clients are SMEs.

According to the evaluation of public provision of business support services in Finland, firms are provided with public support throughout their growth cycle. All kinds of SME needs are covered with relatively large number of different kind of public services. The evaluator didn't find any gaps in service provision. According to the evaluation the public sector seems to attract and support innovative firms more than others. The usage of all types of public services is significantly higher for the SMEs in the technology-oriented sectors than for the whole SME population. The technology-oriented sectors rely relatively more on public services for innovation.[253]

Employment services of the T&E Centres offer also business services like the start up financing for unemployed, educational services for employers etc. The labour offices are their local offices.

Rural Services of the T&E Centres have the task of diversifying and developing the business, the development of local communities and the development of agriculture and forestry. In rural areas the firm can receive development support for planning, education or expertise, which improves products or production methods, business skills, marketing, or internationalisation.

Proagria Rural Advisory Centres are specialised in rural advice. There are 17 regional advisory centres**.** Rural advisory centres offer tailor-made services in all aspects of rural business life. The association of Proagria Rural Advisory Centres and the Centre for Country Women and Homemakers are the umbrella organisations for the rural advisory bodies. Operations are primary financed by service fees charged from clients and by state rural development subsidies, as well as by proceeds from other activities [254]

At regional level the most important organisations are the T&E Centres, rural advisory centres and the financing services of Finnvera Plc. T& E Centres have **business service**

[252] Väänänen 2003

[253] Väänänen 2003

[254] www.maaseutukeskus.fi

points in regions without T&E Centres like in our case study areas Central Ostrobothnia and Oulu South. The business service point offers services to the client's needs holistically. Besides there are **subregional business service points** offering services of T&E-centres close to the firms.

In municipalities there are 200 business agents[255], which advice firms in financing and in start ups, promote entrepreneurship in the municipality, market tourism and manage estates of the municipalities. In addition, many municipalities have rural agents or agricultural agents[256] offering farm-related services. There are about 160 **subregional business development firms or similar service organisations** in Finland owned by municipalities or joint municipal unions. The municipality owned organisations aim to develop businesses and improve employment. The services offered to businesses are mostly free. In many subregional business service organisations there are also subregional business service points (YPP) belonging to the T&E Centres.

Besides there are 80 **regional enterprise agencies**[257] of "Jobs and Society", which have been established in Finland in 1989. They promote especially the start up of micro firms with the help of the expertise coming from business life.

Research and development services are offered by the **Technological Research Centre** (VTT), the **business development units of universities and polytechnics**, as well as by technological centres. There are 22 technology centres being the member of the Finnish Science Park Association TEKEL. In our case area there is one technology centre, Ketek, which is concentrated especially to chemistry. In addition, there are also many other local **technology centres** being not the members of the organisation TEKEL. The technology centres have often **incubators** for the new entrepreneurs. In incubator, the aim is to generate new firms fast with the help of expertises and teams and consultancy.

To help the accessibility of the services to business there are one portal Yrityssuomi,[258] for enterprises, entrepreneurs and future entrepreneurs. The business services of different organisations are presented in this portal.

The service supply provided by the public sector system is comprehensive and meets many needs of enterprises and entrepreneurs starting up a business.[259] As many as every third SME has applied for or received at least one type of government funding. The finding indicates that the Finnish government is rather heavily intervening in the market for SME financing.[260] The probability that an SME applies for and receives Tekes funding is much larger if it is an R&D intensive firm than if it is not. The only characteristic that seemed to reduce the likelihood of applying for and receiving government funding across all types of government funding (except venture capital) is the smallness of an SME in terms of turnover. However, the

[255] "elinkeinoasiamies" in Finnish

[256] "maaseutuasiamies" and "maataloussihteeri" in Finnish

[257] "uusyrityskeskus" in Finnish

[258] www.yrityssuomi.fi/liston/portal/page.lsp?l=fi

[259] KTM 2004

[260] Hyytinen & Väänänen 2002, 33.

smaller firms may be reached more by the business services of the municipality-based organisations.

The public business service system is completed with private business services and with plenitude of development projects. In Finland, about 3000-4000 firms are operating in the field of business services, but they are mostly employing only 1-2 persons. From local point of view, the development projects implementing the regional programmes are an important completing element of the business service system. The development projects can develop businesses in specific sector in regions. In our case study area, the project for development of the small scale food industry in Central Ostrobothnia is one example of this kind of projects.

In **Central Ostrobotnia**, for example the following business services are available:

The T&E Centre for Ostrobothnia with its rural department has a service point in Kokkola.

ProAgria Central Ostrobothnia is one of the 17 rural advisory centres in Finland.

In the Kaustinen subregion there is a subregional business service point Kaustisen seutukunnan yrityspalvelupiste YPP giving advice on different matters regarding starting a business, on funding, enterprise development etc.

In the Kokkola subregion there is Kokkolanseudun Kehitys LTd – Kosek – which is owned by the municipalities in the to subregion of Kokkola. Its main purpose is to try to develop businesses and societies operational conditions in the area. Kosek also aims at promoting economic life and co-operation between communities. It also oversees the area's acquirement of outside financial funding and resources. Kosek offers different advice services to firms.[261]

Keski-Pohjanmaan Uusyrityskeskus ("The regional enterprise agency") FIRMAXI offers free advice and training services especially for the persons thinking about starting a business.[262]

In **Oulu South,** for example the following business services are available:

The T&E Centre for Northern Ostrobothnia has a service point in Ylivieska in Oulu South.

All three subregional units have or are planning to have regional economic development units: The subregional developers are Nivala-Haapajärven Seutukuntayhdistys ry, Siikalatvan kehittämiskeskuksen kuntayhtymä and Ylivieskan Seutukuntayhdistys. For example the Ylivieska subregion business services (Ylivieskan seutukunnan elinkeinopalvelut) is offering business service.

In Oulu South there are four local technology centres: Haapajärven kehityskeskus Oy, Haapavesi technology Center LTD, Nivala Technology centre and Ylivieska Technology centre YTEK.

Haapajärvi municipality industrial and business development services are produced by the company Haapajärven Kehityskeskus Oy owned 100 percent by the municipality. The main task is to develop the business and livelihood in the municipality.[263]

[261] www.kosek.fi

[262] www.firmaxi.kokkola.fi

[263] www.haapajarvi.fi/kehityskeskus.php

Haapavesi Technology Center LTD is owned 51 percent by the municipality, companies and municipality unions being the other owners. The technology centre is serving company founders, companies, municipalities, and foreign partners. 27 companies and organisations operate in its facilities.[264]

Nivalan teollisuuskylä Oy is owned by the municipality of Nivala. In its facility operates Nitek- Nivala Technology Center. It is creating the conditions to development of business and responding the needs of local entrepreneurs. The Center offers enterprises facilities and business services. It is running many local projects especially developing the conditions for electromechanical industry and electronics.[265]

Ylivieskan teknologiakylä YTEK is developing especially the business of information technology and digital media. It has new facilities near the building of Central Ostrobothnian polytechnic. It offers business services to the firms and runs incubator project. It runs also the RFM-polis project.[266]

[264] www.haapavedenteknologiakyla.fi/index2.html

[265] www.nivala.fi/teollisuuskyla/

[266] www.rfmpolis.fi/

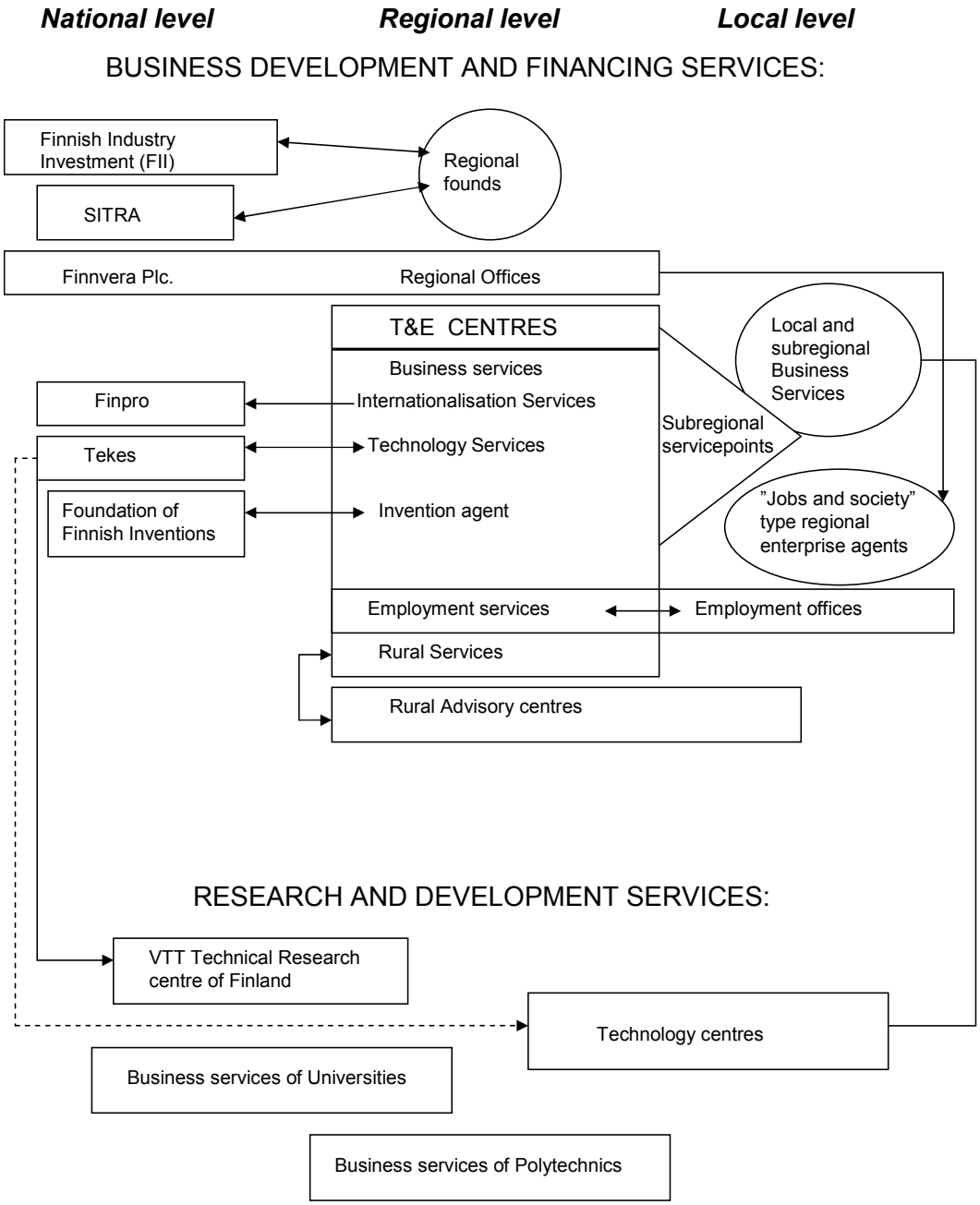


Figure 5. Public system of business services in Finland (Source: KTM 2004, 64)

3.3 Summary of the research context and the policy situation

FINLAND COMPARED TO OTHER NORDIC COUNTRIES

1. Finland is emphasising technology policy more than innovation policy. The technology and science policy has been emphasised in the development of the national innovation system. Interaction between research, industry and administration is broad and intensive according to the international comparison. The NIS is seen as a national project where the regional and local levels are invisible.
2. Industrial policy is broad and the public business service system is comprehensive. The system consists of the support of both the state based and municipality based organisations. The regional programmes and development projects complete the support system.
3. Educational sector, also the higher education, is very much decentralised and regionally dispersed. The decentralised university and polycentric system has been an important agent in regional development, especially in building regional innovation systems. Higher education system seems to be more regionally decentralised and dispersed than in other Nordic countries.
4. There is no independent regional level administration like in other Nordic countries but the joint municipal unions and regional state offices co-operate on the regional level. The regional level is based on municipal level and local democracy. The municipalities are very active in industrial policy. There are many municipality owned development agencies. The ongoing regionalisation process has strengthened the position of the municipality-based organisation.
5. Regional policy has shifted to multilevel and multiactor development policy based on programmes and development projects. This process seems to be farer in Finland than in Norway and maybe also in Sweden but not so far as in Denmark. Programme based development policy has increased the interaction between ministries and sectors in Finland.
6. Rural policy has been established as a policy sector aiming at response to the structural change in rural areas and to the outmigration problems. Rural policy is coordinated by oversectoral Rural Policy committee. It has an integrated development approach both at national and local level. At national level, the policy influences the actions implemented within and through the different administrative sectors.
7. Structural Fund policies have been more important than in Sweden and Denmark. The regional objectives 1 and 2 comprise 60 per cent of the whole country and more than half of the whole population. The national and Structural Fund system can, however, be seen as an integrated whole.
8. The cluster policy has concentrated especially on developing the main national clusters as forest cluster and ICT cluster. The other sectors, like tourism or food industry, are somehow in the shadow of the industries of priority.

PERIPHERAL REGIONS, THE REGIONS OUTSIDE THE BIGGEST GROWTH CENTRES

1. Peripheral regions are outmigration areas, structural change areas, have often high unemployment and problems to generate new jobs. The expanding and dynamic sectors are small in the peripheral regions.
2. Peripheral regions are very different by their economic sectors. The economy can be based on manufacturing and small workshop, on process industry, like paper and pulp industry, metal industry or chemistry. Primary production is important in vast areas. Many regions are specialised in wood processing chain, some in food industry and others in tourism.
3. The settlement structure of peripheral regions is differing. They can be sparsely populated rural areas or small industrial towns.
4. Peripheral regions are in a marginal position of the National innovation system and receive only small amount of resources of science and technology policy.
5. Peripheral regions have been the targets of rural policy, regional development policy, educational policy and industrial policy.
6. The case study area comprises one industrial town, rural heartland and sparsely populated municipalities. The case study area has a declining population due to the outmigration. The area is specialised in primary production and manufacturing. Relatively small proportion of the population has higher education, but the proportion of people with middle degrees (secondary level education) is relatively high. The unemployment rate of the case study area is only slightly higher than the average in Finland. The case study area is located in Western part of Middle Finland. There would have been more peripheral regions in terms of unemployment and population decline in other parts of the country.

3.4 Findings from the study of the food industry

3.4.1 Background information

The primary data for the food industry sector is based on seventeen interviews[267]. Five of the interviewees were representatives of supporting agents and twelve of them were representatives of enterprises[268].

The representatives of the supporting agents worked for the following organisations: rural department of the Employment and Economic Development Centre for Ostrobothnia[269] (the T&E Centre), Regional Council of Central Ostrobothnia, Central Bothnia Rural Advisory Centre and The Project for Developing the Small Scale Food Industry[270], which is administered by The Federation of Education in Central Ostrobothnia.

In term of branches within the food industry in the Finnish case study the focus is on dairy production and on different kind of crop etc. processing[271]. The products of the firms in the case study are described in the following list which gives a picture of the focus in this case study. Representatives of the following enterprises were interviewed in the case study:

- Two **dairy farms.**
- Two **dairies**, which both are cooperatives. The main products of these dairies are the following products or some of them: milk, sour milk, sour whole milk, cream, curd, butter and other fat products.
- **An enterprise in cheese branch.** This firm produces cheeses; the best-known product of this firm being leipäjuusto (a Finnish speciality). This enterprise also imports, packs and markets matured cheeses from Europe.
- Two **farm-connected enterprises processing food products** mainly made of root crops. The products of these firms are mostly local or national specialities. The other one of these enterprises also offers accommodation services[272].
- **An enterprise cultivating and processing potatoes.**
- **An enterprise processing berries** (juices, jellies etc.).
- An enterprise bottling **spring water** and also producing other drinks.
- **A mill** producing flour and other corn products.
- **A wine farm** with also tourism activities[273].

[267] Most of the interviews took place in May and June 2004. Three of the interviews were done in August 2004. The interviews took usually about an hour.

[268] Selecting the enterprises was based firstly on researchers' preconceptions of the enterprises in the region, secondly on the information obtained from different enterprise registers and thirdly, some relevant information was received from the interviews of the supporting agents.

[269] There were two interviews and two respectively representatives of this T&E Centre's Kokkola office.

[270] "Pienimuotoisen elintarviketuotannon kehittämishanke" in Finnish.

[271] When studying food industry in Central Ostrobothnia, the importance of meat processing is significant for example in terms of the number of employees. However, this is mainly down to one single firm with over 100 employees. Because the focus of the ISP-project in the food production was on firms with less than 100 employees, the meat branch was excluded in the Finnish case study.

[272] This enterprise is also included in the case study of the tourism sector.

[273] This enterprise is also included in the case study of tourism.

The farms in the case study are mostly family estates. Almost all of the entrepreneurs came from a farm in Central Ostrobothnia. The newest enterprises in the case study had been operating for about a year. Most of the other enterprises were established in the 1990's. The two dairies in the case study are approximately a hundred years old.

All the enterprises except the dairies were driven by entrepreneurs. Seven of the enterprises gave work for entrepreneur/entrepreneurs/the entrepreneur family (1 - 4 persons), but not much for external employees (except for possible temporary staff). The five biggest enterprises employed between nine and 50 persons (including possible entrepreneurs). The biggest firms by the number of staff were the dairies, the firm in the water branch, the firm in the cheese branch and the firm in the potato branch.

Out of the eleven enterprises[274] there were two firms with a revenue under 100.000 euros, six firms with a revenue between 100 000 and million euros, and three firms with a revenue over one million euros in 2003.

Suppliers of most of the enterprises were situated in Central Ostrobothnia or in surroundings of the region. The raw materials for the firms came mostly from Central Ostrobothnia or its surroundings. At least three of the firms had also foreign suppliers.

Approximately half of the firms had their markets in the region or in the surrounding regions. The other half of the firms had their markets in the whole country or in some parts of the country. Some firms had big Finnish wholesale and retail groups as their customers.

3.4.2 Knowledge and competence base

It appeared that neither the entrepreneurs nor the employees of the case study firms had not much advanced degrees (higher university degrees). Some entrepreneurs, particularly the younger ones, had a polytechnic degree or corresponding studies underway. Many of the entrepreneurs and employees had a vocational education degree from a school or a college. Many entrepreneurs had attended several courses or other short-term education.

A significant part of the employees seemed to lack vocational education related exactly for their tasks in a firm. The staff of the dairies seemed to have relatively more branch-specific education. The entrepreneurs mostly did the administrative work themselves and the employees worked usually mainly in production.

Training employees to do the work and learning in work was important in the firms. The level of degrees or the lack of them didn't seem to be a special problem. In certain branches in the food sector there is very little education available leading to a degree. In the mill branch there isn't any formal education at all in the country. Vocational and polytechnic degrees in dairy branch are available only in one place[275] which isn't near the region. One of the representatives of the enterprises stated that the low number of dairymen in the labour market is a weakness to some extent. However, the firm in question had succeeded in getting local staff with a high motivation for the work. Good employees were highly appreciated in this firm. In another enterprise people working for the firm were considered as one of the firm's success factors, too. In this firm everyone had skills to do at least three different jobs.

[274] The revenue of one enterprise is not known.

[275] in Hämeenlinna

Thus the knowledge and competences in the enterprises was very often gained by experience and by hands-on learning. The meaning of learning by doing is illustrated by an example of one firm, which needed to get more skilled employees to work for the firm. In this firm they were considering different options for getting skilled employees. Apprenticeship contract was seen as one of the solutions for the specific reason, that there simply doesn't exist any educational institute where you could learn the skills required in the firm. Also knowledge and competences passed by the parents was appreciated among the entrepreneurs working in the family estates.

It was in production where most of the firms had their most important knowledge and competence for future implementation of novelties. Mastering production process and expertise in raw-material were considered important in terms of knowledge and competence. Also own control and quality system related to production were named in one firm. The knowledge and competence in production was based on the long experience in many of the enterprises. Knowledge and competence in for example pricing, leadership, "business hunch" and a skill to make investments when needed so that it brings cost savings were also mentioned in single enterprises. Courage to do business and try new things, initiative and stubbornness were also mentioned by single entrepreneurs.

Also most of the representatives of the supporting agents considered production skills as the most important sector of knowledge and competence in the region's food industry firms. One of the representatives of the supporting agents thought that the lack of formal education in the region is a weakness; further qualifications must be taken elsewhere. According to this interviewee enterprises have learned to foresee the need of labour force and greatly train their own personnel. Another representative of the supporting agents thought that personnel are treated well and turnover of workers is low, which has a great impact on the economy of these firms. In one of the interviewees' opinion the small enterprises in the food industry sector have been forced to seek a lot of information and that the expertise of these firms is in a very high level. According to another representative of the supporting agents these enterprises have comprehended that they sell "Central Ostrobothnianism" in the other words clean nature, clean milk etc. and believe in this concept. One of the representatives of the supporting agents considered the following characteristics of the people in the region also as a competence: stubbornness, wariness and fear of failure which have to do with good administration of finance in farms and small enterprises.

Training had been arranged or some kind of training (lectures, courses etc.) had been attended in most of the enterprises in the past two years. Trainers/instructors were from private, semi-public or public sector from the region and outside the region and mostly others than actual education institutes. Some of the entrepreneurs attended projects, through which they received new knowledge. The amount of contacts with educational or research institutes was low.

More than a half on the firms was in need of strengthening or widening their knowledge or competence base. Marketing and financial administration were those sectors in which seemed to be clearly the most substantial need of new knowledge or competence. Above marketing and financial administration there were single firms that were in need of new competence in product development.

The representatives of the supporting agents seemed to think that knowledge and competence was mostly needed in marketing. Single representatives of the supporting agents also thought

that enterprises needed new knowledge or competence in the following sectors: product development, networking, learning to find new find future market niches and fixing keen prices.

Some of the firms in need of gaining new knowledge or competence had made plans for how to obtain this knowledge or competence. Few of the enterprises needed new knowledge or competence especially due to future changes in business. In one small enterprise there were plans to find and train a substitutive employee, which would be a long process. However, most of the firms in need new knowledge or competence didn't have any plans for obtaining it.

There weren't any particular problems associated with gaining knowledge or competence. Sometimes it just takes a long time to find the right information.

3.4.3 Innovation activity

All the enterprises except one had implemented innovations in the past two years. Over half of the firms had implemented more than one innovation in this period of time. In most cases the renewals were product innovations. The next common was renewals in production process and in marketing.

The enterprises are divided into three groups when studying their innovation activity. This classification is based on the analysis of the primary data. In general, the operations of farms differ from the operations of processing firms and that is why the two milk farms are studied separately. Three firms that seemed to be more innovative than the firms on an average, and which also seemed to have some common characteristics constitute the second group. The rest of the enterprises (six firms) constitute the third group.[276]

Dairy farms

The dairy farms had implemented many renewals. The farmers were members of cooperative dairies, where milk from the farms was delivered. Hence there had been no renewals in marketing. Innovations related mostly to production, quality of the product and improving productivity. For example following renewals were implemented: building a new barn or expanding the old one, changes in tending (for example in feeding) the cattle and changes in cultivation.

The rise of the amount of cattle by expanding was the most important renewal in these enterprises and many other innovations were related to this. The main reason for expanding was a goal to become a competitive unit. Although the renewals were mainly implemented by the farmers, they had utilised different services and practised cooperation with different actors. For example the following partners were mentioned: Rural Advisory Centre, municipality, bank, T&E Centre, other dairy farms, dairy and suppliers. There had been no major problems in implementing the innovations nor had there been failed attempts to implement innovations.

[276] This classification was chosen so that the enterprises wouldn't be recognizable. For example, there are only two regionally owned and administered dairies, which are both in the case study data.

Highly innovative firms

Three firms in the case study seemed to be more innovative than the firms on average. These firms differ in size. There had been many innovations in all of these firms in the past two years. All of them had implemented product innovations. Other innovations were among other things related to production process, new operations, markets and distribution. Also new firms were started up to supplement operations.

Naming the single most important innovation was difficult partly because innovations implemented related to each other. This was the case at least in two of the firms. Both of these enterprises had implemented important innovations in way of action, in production process and in products. The most important innovation for the third enterprise in the past two years was a new way of marketing a certain product (a new distribution channel).

At least two of the firms had introduced new clearly market oriented products. In the other firm the need for a new product was discovered the consumer point of view in focus, also the distributors were cooperating in this process. The other enterprise had introduced new products because of an initiative presented by the customers (distributors). One of the firms was in an early stage of the market oriented innovation process brainstorming, making their rounds in the market and having discussions with consultants aiming to get a good picture of the market. Foreign contacts had an important role in this process.

Some of the innovations of these three firms had been implemented in cooperation with partners. A common feature for these firms was that they had partners from elsewhere in Europe. Information was sought from abroad. All of the three had also suppliers in Europe. All of them had networks in Finland, too. In terms of their products two of these firms are unique in Finland, one of them at least in the region. The enterprises hadn't had any major problems in implementing the innovations nor had there been failed attempts to implement innovations.

Other firms

The other firms had each implemented one or two innovations in the past two years. The most common innovation was a new product. One of the firms had started to invest in a determined product development in order to introduce new products. Innovations related to marketing had been implemented in two firms. Marketing communication was renewed in the other firm and distribution channels in the other one. Other innovations in this group of firms were a renewal in production process and a renewal in the information system. The most important innovation had to do with products in three firms, with marketing in two firms and with a wide renewal of the information system in one firm.

The reasons for implementing innovations were many. In one enterprise they decided to implement an innovation after considering the strategy of the firm; what was needed in order to be in the market in the future, too. In another firm they decided to implement a renewal because the old system was outdated and new operations were needed. A new distribution system was adopted because the old one was laborious, disorganised and overlapping. In one firm new products were introduced in order to attain steady

operation and continuity, but also in order to level seasonal alterations. One new product was a result of entrepreneur's own thinking about use of the raw-material. Four of the six firms markets products that any other firm doesn't produce in the region.

It seemed that innovations had been mainly implemented by the firm in question. However, the firms cooperated with other firms in their innovation processes to some extent. One entrepreneur told that she/he had her/himself greatly developed renewals in products, but also customer firms had given ideas, which she/he had then exploited. There hadn't been any insuperable problems in implementing innovations, but some problems related to resources, timetables, marketing and products had occurred. There were no failed attempts in implementing renewals. Most important impacts of renewals were among other things a rise in revenue and in sales, facilitation the work and division of labour becoming clearer in the firm.

Some of the representatives of the supporting agents thought that renewals in marketing were typical innovation activity for the enterprises in the food industry sector. As the reasons for innovation activity they named among other things the following factors: responding the market demand, a need to find new marketing and distribution channels, lack of opportunities in traditional farms in cultivation and an effort to improve profitability and viability by finding new means and ways of action. According to one of the representatives of the supporting agents entrepreneurship starts often as a hobby in order to obtain extra income. When the entrepreneurship is seen to be profitable, it has to be decided how to succeed in expanding the business. Marketing and creating distribution channels, getting into wholesale and retail groups, becomes a problem. Big demand causes problems with capacity for a small firm and requires expanding, which can cause problems with funding.

What comes to the future innovation activities the dairy farms had some renewals related to extensions coming up in the near future. All of the three extra innovative firms had plans for major renewals in their operations. More than half of the other firms had plans for innovations. These plans had to do with one or several of the following sectors: product development, production process, expanding the premises, marketing and logistics.

Economical resources might possible be barriers for innovation for approximately half of the firms. For example in one firm they discussed how much more they would accomplish if they could afford extensive product development. At the same time they experienced the work meaningful also for the reason that it isn't so simple. They had used their own inventiveness and experimented themselves, because there wasn't any other choice.

One of the representatives of the supporting agents thought that lack of money for product development is the most hindering factor in innovation activity. According to him/her outsourcing product development is so expensive that firms usually can't afford it. Also other representatives of the supporting agents considered the lack of resources as a hindering factor in innovation activity. One of the interviewees thought that the entrepreneur has to decide whether he/she wants to keep the business small or whether she/he wants to make it a bigger successful firm. Although the entrepreneur knew there would be chances for success by expanding, she/he doesn't always want to take the financial risk related to expansion.

The most important knowledge and competence for the firm (chapter 3.2.) was usually the main internal facilitating factor for innovations. The most important knowledge and

competence for these firms were factors related to production like mastering production process and expertise in raw materials. In addition for example in one firm the following internal factors were named: industriousness, motivation for the work, flexibility, reliability and willingness to do a good job. However, a good product and networks were seen as the most important factors in this enterprise.

3.4.4 Cooperation and networks

Most of the partners of the firms in the case study were other firms. Almost all of the enterprises had had cooperation with other firms. The partner firms were mostly clients, suppliers or other firms in the same branch in the region or elsewhere. The cooperation with the firms in the same branch involved among other things marketing. Some of the firms had cooperation in very many things starting from borrowing supplies. One of the entrepreneurs stated that the attitude in the enterprise sector has slightly changed: nowadays you can also sell other firm's products and buy from another firm, even if that firm was a competitor.

Some of the firms producing products complementary to each other were cooperating by marketing packages of products. This kind of cooperation was carried out by some of the firms in the case study with each other and also with other firms. In one of the firms with this kind of cooperation was the proximity of the partners considered important. Also in many other enterprises was the nearness of the partners regarded important.

The firms in the region had also cooperation in logistics, mainly in deliveries. One of the interviewees said that Central Ostrobothnia is a difficult region in terms of deliveries with many small localities and long distances.

When reviewing other partners than firms, mostly were mentioned the following actors: T&E Centre, the Project for Developing the Small Scale Food Industry[277] and the Rural Advisory Centre. Firms had been given advice, funding, training and other support by these actors. In addition, new business and other contacts had been made at least with the help of the Project for Developing the Small Scale Food Industry.

Partners were assumed to be mainly the same in the near future in almost all of the enterprises. Generally the interviewees thought that there was no lack of services or knowledge.

3.4.5 Innovation conditions

Most of the firms had utilised different support offered by the public sector in the past two years: advice, funding or other services. The services of T&E Centre had been used the most often. The next commonly used were the services of the Project for Developing the Small

[277] The area of operation of the Project for Developing the Small Scale Food Industry is the subregion of Kokkola and the subregion of Kaustinen. The emphasis of the project is on developing, product development, marketing and package design of farm-related food production. Development of transport systems is also part of the project. The project serves enterprises also by helping with funding applications. The goal is also to promote cooperation between primary production and processors so that farm production would also be processed locally and marketed forward as complete products. (www.elintarvikkeet.fi)

Scale Food Industry (funded by T&E Centre). The support of these actors had fulfilled the expectations of the firms. A couple of the interviewees mentioned that the Project for Developing the Small Scale Food Industry had even surpassed their expectations.

The general attitude towards entrepreneurship and innovations in the locality and in the region divided into two groups from the firms' point of view: on the other hand there had been encouraging attitude but on the other hand there had been enviousness. More than one of the interviewees for example stated that people from the firm's locality didn't by products of the firm. Couple of the interviewees were dissatisfied with municipality. On the other hand, some interviewees were very satisfied with the actions of municipalities.

No common factors hindering or facilitating implementation of renewals that had to do with the local or regional environment was found in the case study. The population of the region and of the country is small compared for example to Central Europe. According to one entrepreneur this leads to a situation, where you have to do more different products, although it would be less laborious to do serial production of one product.

One of the representatives of the supporting agents stated that the lack of education for the needs of the food industry is a weakness. According to one of the interviewees there is a need for a service organisation meant merely for the firms in the food industry sector. In one interviewee's opinion the long distances in the region sometimes hinder cooperation of firms.

Not much common factors hindering or facilitating implementation of renewals that had to do with the national environment was found. High production costs and the distance to big markets were mentioned in some firms, but on the other hand the importance of clean nature and clean products was emphasised. According to one entrepreneur the common attitude towards agriculture has been negative compared to other European countries before, but is now getting better. The high level of research of agriculture in Finland was considered as a facilitating factor for innovation activity in one of the firms. The upcoming decisions that had to do with taxation policy in a certain branch would be of great importance for another firm's development

One of the representatives of the supporting agents emphasised that technology funding should be near the regions so that programmes would be better attainable which would be important for the competitiveness of the firms.

EU affected especially to the operation of farm enterprises, which is very narrowly regulated. In many firms the bureaucracy and the amount of paperwork were the negative side of EU's regulation. In most of the firms EU's influence was seen as positive. Many of the firms had received EU funding.

3.5 Findings from the study of the tourism industry

3.5.1 Background information

The primary data for the tourism industry is based on fifteen interviews[278]. Five of the interviewees were representatives of supporting agents and ten of them were representatives of enterprises[279].

The representatives of the supporting agents worked for the following organisations: rural department of the Employment and Economic Development Centre for Ostrobothnia (T&E Centre)[280], the Regional Council of Central Ostrobothnia, Kokkola Tourism Ltd[281], Pirityiset ry.[282] and Central Ostrobothnia Adult Education Institute[283].

Services of almost all of the enterprises in the case study are fundamentally connected with the natural or cultural surroundings of the region. Representatives of the following enterprises were interviewed in the case study.

- Four enterprises offering **accommodation in cottages and/or houses** and food services**.** Three of these firms offer also **programme services mostly connected to nature.** Almost all of the accommodation facilities are located onshore by the sea or a lake in a peaceful place. Recreational services and programme services are central part of the operations of two of the firms, which offer for example wilderness guidance, hunting, berry picking, fishing and hiking. Two of the four firms offer also catering service and premises for events and meetings. Two of these firms act also in the food industry sector[284].
- An enterprise with a rich peasant museum and an animal park. The firm also offers food-services as well as meeting and banquet catering services.
- A nationwide Youth Center[285] operating among other things in international youth activities and in nature school. The firm offers also accommodation and food services, services related to nature and meeting and banquet catering services. The firm is located by the sea.
- A Folk Medicine Center[286] offering mostly treatments based on folk medicine (in cooperation with school medicine). The enterprise practises also educational and

[278] Most of the interviews too place in May and June 2004. Six of the interviews were done in August 2004. The interviews took usually approximately an hour.

[279] The starting point in selecting the firms was the common agreement of the ISP research team to focus on firms offering recreational services related to region's cultural and natural environment. Selecting the enterprises was based both on researchers' preconceptions of the enterprises in the region and on the information that was obtained from the representatives of the supporting agents.

[280] The representative of the T&E Centre was interviewed both regarding tourism and food industry sector.

[281] Owned by the town of Kokkola

[282] An association, a local action group with a development programme for the subregion of Kaustinen.

[283] A study programme in tourism activities started in 2004.

[284] Another one of these firms is in the data of the food industry sector too.

[285] This enterprise is owned by municipality.

[286] This enterprise is owned by a foundation.

research activities and offers accommodation and food services mainly for treatment package tourists.

- A trotting-track[287], which main operation is race-events in trotting. The trotting-track is situated in the Center of harness racing, training and education.
- A Folk Arts Centre[288], whose starting points for operations are maintaining, promoting and developing folk music and folklore. The products of the enterprise are for example performing arts, education, meetings services, programme services and restaurant services. The most visible part of the operations is the big yearly folk music festival.
- A wine farm[289], which also offers travel packages for groups.

Almost all of the enterprises were established in the 1980's or in the 1990's. Two of the enterprises are owned by a foundation, one by an association and one by a town. Other enterprises were driven by entrepreneurs. Almost all of the entrepreneurs came from a farm in the region.

Five of the enterprises gave work mainly to entrepreneurs/entrepreneur family. Part of the entrepreneur-driven firms didn't give all-day work to owners. One of the entrepreneur-driven firms gave work also to outside personnel. The other firms employed between five to 25 persons. In some firms the amount of personnel increased considerably during the summer or during different events.

Out of the eight enterprises[290] there were three firms with a revenue under 100 000 euros, three firms with a revenue between 100 000 and one million euros and two firms with a revenue over one million euros in 2003.

The role of suppliers weren't very important for all of the firms. It appeared that the suppliers were situated in the region or surroundings of the region in most cases. Some of the firms had cooperation networks where services were bought and sold to complement own services.

All the firms had customers from all over the country. Some of the firms had customers mostly from certain parts of the country. Foreign customers seemed to play an important part in the operations of at least four of the firms. For example some of the firms offering hunting or other programme services related to nature had regular customers from Central Europe.

Since the firms in the data were diverse, there were diverse customer groups depending on the services the firms offered. It seemed that families were an important customer group for approximately half of the firms. Business customers were a significant customer group also for approximately half of the firms.

[287] This enterprise is owned by an association.

[288] This enterprise is owned by a foundation.

[289] This enterprise is also in the data of the food industry sector.

[290] The revenue of two enterprises is not known.

3.5.2 Knowledge and competence base

The level and field of education in the tourism firms were various: different courses, vocational degrees and also advanced degrees. It seemed that the entrepreneurs and the personnel usually had a suitable education for the firm and for the tasks in question. Degrees in tourism seemed to be very rare.

The most important knowledge for future innovation activities varied among the firms. The most important knowledge had to do with product in the majority of firms; the most important was some sector of knowledge or competence needed in producing the service. The knowledge and competence was a result of a long experience and for example of entrepreneur's own interest in many of the firms. For example one of the entrepreneurs told that customers appreciate the spirit and knowledge gained by long experience: this can't be gained by just reading books. In another firm expertise in local natural surroundings, caring for people and good networks were considered the most important knowledge. Other sectors of knowledge mentioned in single firms were among other things organising events, customer expertise, networking, knowledge in nature, language skills and marketing.

It appeared that entrepreneurs and personnel had attended training in most cases in the past two years. Schooling seemed to be very active in some of the enterprises. The contents and duration of training varied considerably among the firms. There were both short courses and long training processes. There was a big variation also among the training establishments which seemed to be mostly outside the region. At least two of the small firms had obtained information from the regional (sub-regional) projects in tourism.

There was a need of strengthening or widening the knowledge in most of the firms. This need had mostly to do with marketing. There was a need for a general marketing knowledge in some firms, some sector of marketing like sales or customer service was mentioned in other firms.

According to one of the representatives of the supporting agents firms need more knowledge in productisation and product development. In his/her opinion the significance of productisation is not understood in many small firms: an idea is not a product which can be sold to tourists.

The firms which needed to strengthen or widen the knowledge had in most cases plans how to obtain this knowledge either by training or by hiring an outside expert. Some of the representatives of supporting agents considered entrepreneurs' lack of time as a problem in gaining knowledge in small enterprises.

3.5.3 Innovation activity

All the enterprises except one had implemented innovations in the past two years. Clearly most of the innovations had to do with products. These innovations were either new products or product entities or improvements in products. At least six firms had introduced one or several new products. Other innovations found in the case study were renewals in marketing. Organisational renewal was implemented in one firm. Naming the most important innovation in the past two years was difficult in some firms. However, a new product or a product entity was clearly the most important innovation in four of the firms.

Concrete reasons for implementing innovations were many and they varied among the firms. Small renewals and improvements were done continuously in some of the firms. These renewals were both renewals in physical settings, like building new accommodation facilities or saunas or improving the old ones, and for example renewals in programme services. Small renewals were made in basic products and something new developed yearly thinking especially regular customers in many firms. At least two of the firms had yearly changing themes related to a certain product which at the same time meant continuous renewing. At least for two of the firms some of the new products were results of projects. These projects weren't actual tourism projects but projects in a certain branch.

Reasons for extending facilities were among other things following: to have room for regular customers when they wish, to make the visitors stay longer, to enable more flexible operation and to get new customer groups. An effort to prolong the season was the reason for developing new products in one of the firms.

It appeared that in most cases the innovation processes had started as a result of inter-firm reasoning and that also the implementation of innovations had been carried out by the firm as a rule. However, at least for two of the firms the role of partners both in the ideation and implementing stages of innovation processes had been significant. For these firms and also for some other firms networks were an important part of operations.

No common problems in implementing innovations were found among the firms in the case study. The following factors, which weren't necessarily seen as problems but perhaps rather as challenges, were mentioned in single firms: the knowledge of the region among potential customers, weather conditions, enviousness among the inhabitants of the municipality, internal marketing, lack of a common view of the importance of a renewal and the national environment of a certain branch.

There hadn't been actual failures in implementing innovations. Instead the following disappointments were mentioned in single firms: cooperation with another firm didn't work out as expected; a renewal being planned for many years hadn't gone ahead because of the delaying in the municipality; a project person responsible for a new product had left the firm; and some small renewals in firms operational matters hadn't worked out quite as expected. A significance of committing personnel was emphasized in one of the firms. A certain renewal wasn't discussed sufficiently among personnel, and this had had a negative effect on firm's internal atmosphere.

The most important impacts of innovations varied among the firms. The following factors were mentioned in single firms: season was prolonged, supply of products was diversified and increased, company image was diversified, new customers and finally, clearer products which also facilitates marketing.

One of the firms had expanded to totally new market. For some of the firms a share of particular customer groups had grown clearly in the past two years. Regionally new innovations had been implemented in at least five of the firms. On the other hand, the products or product entities of at least three firms are unique at least nationally. As one of the entrepreneurs noted there hasn't been anyone to set an example.

Almost all of the firms had plans for innovations in the near future. Nearly all of these planned innovations were related to products. Four of the firms were planning major renewals

which mostly had to do with new products or product entities. One of these four firms was starting a big building project by means of which it was going to expand.

No common factors in firms' internal environment that could be hindering implementation of innovations were found in the case study. The facilitating factors for innovation activities had to do with knowledge and competence of the firms (chapter 4.2.). In addition personnel as a facilitating factor was mentioned in two of the firms. In another of these firms great store was set by rich conversation among personnel and by encouraging the personnel to present ideas for innovations.

It seemed that in most of the enterprises future was seen as good. At least four of the firms planned to expand their business.

3.5.4 Cooperation and networks

The largest single group of partners for the firms in the case study were other firms. Most of these partners were from the region, some of them also from elsewhere in Finland and from abroad, too. Tourism services were produced with partners, but in some cases partners were also suppliers or sponsors.

As an example of an intensive cooperation in producing services is an enterprise offering tourism services related to nature. This firm bought and sold services mutually with its partners. This ways these small firms were able to diversify their programme and food service supply and build up different packages to customers. By cooperation these firms could take on also bigger groups, which wouldn't be possible by operating alone.

According to one of the interviewees the entrepreneurs in Central Ostrobothnia should have a better knowledge of and respect for each other's services and to understand that customers of one firm benefit also other firms in the region. The entrepreneur thought that expanding the networks was difficult because of the general attitudes among firms.

Other partners besides firms that were mentioned in more than one firm were T & E Centre, municipality, Kokkola Tourism Ltd, educational institutes, Pirityiset ry. and different regional and national associations and organisations. A big part of these partners were situated in the region. In addition different single actors relating to firm's special branch were mentioned. These actors were located in the region, elsewhere in the country and abroad.

3.5.5 Innovation conditions

Most of the firms had used different support offered by the public sector; advice, funding or other services. Services of the T&E Centre were mentioned more often than others. Other actors mentioned in more than one firm were Kokkola Tourism Ltd, Kosek and the Regional Council of Central Ostrobothnia.

The general attitude towards entrepreneurship and innovations was seen as negative at least in four of the firms. For example the following factors influenced this: enviousness, the attitude of municipality and the fact that the people in firm's municipality don't use the services of the firm. In other firms in the case study the general attitude was mostly seen as positive. One of

the interviewees described the attitude so, that it is not necessarily negative, although there wouldn't be any positive feedback. In the experience of two of the interviewees the younger generation's attitude towards the local tourism enterprises is much more positive.

As factors possibly hindering innovation activities that had to do with local surrounding were mentioned in single firms among other things the following: enviousness, poor availability of complementary services, municipality's negative attitude and conceivable ruination of the nature. As one of the facilitating factors for future innovation was seen the positive cultural ground in the subregion of Kaustinen, where different sectors of folklore complement each others also as additional services, and have a positive effect on image and credibility.

Not much common factors hindering or facilitating implementation of renewals that had to do with the national environment was found. According to one of the entrepreneurs it is easier to operate in Finland than for example in Central Europe, because of the extensive everyman's right related to wandering in the woods, making a fire and picking berries and fungus. One of the entrepreneurs thought that it would be better for the tourism firms if the schools would start their autumn terms later than in the mid of August. Increase in free time in general, increase in firms' recreational days and people wanting to seek to the calmness of the nature were mentioned as positive factors from the viewpoint of two of the firms in the case study.

Outlooks on the tourism in Central Ostrobothnia from the interviewees' point of view

According to one of the representatives of the supporting agents there is a lot of unused potential related to sea, history and agriculture in Central Ostrobothnia. In the opinion of another representative of the supporting actors it would be important to have also experts in tourism with when planning barns and other buildings for domestic animals. Nowadays outsiders are not allowed to enter these premises. By planning it would be possible to offer familiarizing animal husbandry as part of the tourism services in the future.

According to the representatives of the supporting agents tourism in Central Ostrobothnia will develop and grow in the future. As a potential was seen for example the cultural surroundings in the Kaustinen subregion with folk music, folk medicine and horses; tourism based in natural surroundings especially in the sparsely populated Kaustinen subregion with wilderness; event tourism; and sea and archipelago in the Kokkola subregion. According to one of the representatives of the supporting agents there already are many small beginnings related to sea topic and developing these can growth be generated. According to another representative of the supporting agents the small specialised firms networking with each other and on the other hand perhaps the big firms have potential to succeed. It seemed that many of the interviewees thought that tourism in the region is somewhat amateurism and that it should change into more professional business in the future. One of the representatives of the supporting agents predicted that there will be a large number of programme and accommodation services so that travel agencies are interested to sell trips to the region for Central Europeans in ten year's time.

In order the tourism in the region to develop, an organisation to develop and coordinate the region's tourism should be established. This was the opinion of many interviewees. The single interviewees brought forward for example the following opinions: Tourism as a business and as an industry is new in the region. There are only a few people who are really experts in tourism in the region. Operations are often based in amateurship and tourism is not

seen as a real business. It would be important to generate more year-round operations and to gain more profitability. This way the quality of the products could be developed. Firms don't have enough resources for development at the present moment. Also the question of hiring outside personnel is related to these problems. New knowledge and common coordination in marketing is also needed. In order to be able to offer travel packages in the future, a chain of many small firms has to function. The region lacks for example a firm which selling travel packages for the region.

Also in the interviews came up the fact, that there are at least three very different sectors in tourism in Central Ostrobothnia: tourism in Kokkola, tourism related to folklore in the subregion of Kaustinen and tourism related to nature. The single interviewees brought forward the following opinions: A common coordination, developing and marketing is needed so that the region would look more coherent to customers from outside the region. This common effort would very much facilitate the tourism in the region, but there hadn't been a common will for cooperation so far. The potential in tourism in the region is not seen and not believed in. There are supplies of funding for developing the tourism in the region, these supplies are just not exploited enough.

There are single but usually disconnected efforts in the field of tourism in the region. Minor policy efforts may reflect the role of rural tourism in the regional strategies, perhaps also in the national strategies.

3.6 Findings from the study of electronics industry

3.6.1 Background information

The primary data for the electronics industry is based on thirteen interviews.[291] Four of the interviewees were representatives of supporting agents and nine of them represented enterprises.[292] The representatives of the supporting agents worked for the following organisations: Centria, the research and development department of Central Ostrobothnia Polytechnic, Oulu South Institute being part of the University of Oulu, industrial village/technology centre of Nivala municipality and RFM-polis being part of the Multipolis network of Northern Finland. [293]

Six of the interviewed firms were operating in manufacturing and three firms mainly in planning or R&D. The manufacturing firms were mostly specialised in sheet manufacturing (thin plate mechanics), which is used in telecommunication but also in other industrial electronics like medical instruments technology and energy technology. Only one firm had own products, alarm systems and equipment. However, another firm had own products,

[291] The first interview took place in April and the last in September 2004. The interviews took usually about an hour.

[292] Selecting the enterprises was based firstly on researchers' preconceptions of the enterprises in the region, secondly on the information obtained from different enterprise registers and thirdly, some relevant information was received from the interviews of the supporting agents.

[293] Multipolis Network is a project with an objective to improve the provision of services to expertise clusters lying outside of the Oulu region in Northern Finland. The network relates to Oulu Region Centre of Expertise. The Multipolis Network was approved in the national programme of centres of expertise in 2002. (www.elsi.net.Polis.fi)

antennas, but its production plant didn't locate in Finland. All other firms acted in different positions in an industrial network, in which the end-users of the products were very far from the operations of the firms. These firms are operating in the value chain of wireless technology and their production depends on their position in the vertical production network. The interviewed firms were contract manufacturer, subcontractors and component manufacturer. The biggest manufacturing firm has grown and gone forward in the value chain being a contract manufacturer that is now in a process becoming a system supplier. Some other firms have also managed to go forward in this chain.

Two firms employed less than five people; three firms employed 5-10 persons, three others from 11 to 50 persons in the region and 1 firm more than 50 persons in the region. The turnovers of the firms varied so that the turnover of the smallest firm was less than 100 000 euros, three firms showed turnovers between 200 000 and 600 000 euros and three firms between 2 and 5 millions euros. The biggest firm had a turnover of 40 million euros (including all plants and ownerships).

The oldest firm was grounded in the year 1989, three firms were founded between 1994 and 2000 and five of them later on. The newest interviewed firm has had business less than one year in the time of the interview in spring 2004. Even if the majority of the interviewed firms were newcomers, the founders, the entrepreneurs or the teams of entrepreneurs had a long experience in the branch.

Locals founded the oldest firm in the region in 1989 when the founders saw the possibilities of the new fields. In addition, the success of the two regional key firms (Scanfil and Ojala-yhtymä) had encouraged the foundations of entrepreneurs. The firm grew rapidly especially since mid 1990s when the industry of the region got a tow of the growth of Nokia Networks. The oldest firm has succeeded in going forward in the value chain in the direction to the system supplier.

Three firms were founded as spin off from other firms. In one case, the founders left the big firm because they thought that the big firm ignored the small-scale business possibilities. In two other cases, the activities for which the founders were responsible had been closed or restructured (shifted to other firms or countries). In all of the cases, the networks and clients related to the founders in the time of the foundation.

In two cases, the firms were founded because of the needs of bigger firms in the localised industrial network. In the one case the founder was a relative of the manager/owner of the bigger firm and he was also working there in the big firm. In the beginning, the firm was the supplier of this big firm but now it has diversified. The other case was a spin off from Central Ostrobothnia Polytechnic when the bigger firm (producing shoes) persuaded the developer of mould in the polytechnic to be the production manager of a new firm. The product idea was earlier a development project together with the shoe firm and the polytechnic. Later on this firm diversified from shoe moulds to other branches.

Two bigger firms needed specific knowledge and planning concerning the feasibility of the products or production and they found one planning firm.

Two of the interviewed have their roots in the region, but they have been working in the southern Finland before returned to the region. The other one founded an enterprise in the beginning of 1990s; the other was recruited as a manager of the firm. One firm has no roots in

the case region but it was founded in the region due to the testing room of the local polytechnic and due to the estate given by local technology centre. Both the testing room and the offices/rooms in the technology centre were much cheaper than in Oulu where the main office of this firm is located.

The newest firm was grounded through an incubator project of the local technology centre in summer 2003. The background of the entrepreneurship was the decreasing of the activities in the earlier workplace of the founder and the niche the founder noticed in the production system of electronics industry.

3.6.2 Knowledge and competence base

The degrees of the staff varied in the manufacturing firms but the vocational degree was the most general. In planning firms, the staffs were mostly engineers or technicians. They had mostly degree from the local polytechnic, which was earlier a technical college.

The interviewed employers seem to be pleased with the local vocational school. Learning in the work is important because technology is developing rapidly. Most important seems to be the ability to learn new things, which differs from the formal education. One interviewed pointed the firm's aim to recruit new people with at least degrees of vocational school. Nevertheless, the interviewed pointed that more important than the formal education is the will to success in the work.

The specific skills in firms are mostly in production methods and in the use of technological knowledge. In many manufacturing firms the employees use ICT-based machining. They have lot of practical knowledge of the tools and machines as well as of the programmes. They are adapting the programmes in new ways in machining. They are pointing also the automation. One interviewed mentioned that his firm is a pioneer in using robots in Finland.

The firms seem to be quite strong in technological skills and knowledge on production methods. Many firms needed more knowledge on marketing and the marketing skills were not sufficient for them.

In manufacturing, both individual and organisational learning seem to occur mostly through client's projects and orders and through development projects. The skills are enhancing through the projects which are based to the previous skills and knowledge.

" we do have the real interest and will to learn and to take always more difficult projects during these three years (after foundation SV). They have given us impossible projects but when we have taken even them and succeeded with them we (the manager team and the workers) have learnt and grown (as professionals)."

"In practice it means to declare the needs of the clients and evaluate how the project fit to our production capacity, and the timetable, which is always too tight."

New knowledge can be gained through the demands of the client. *"Even if we know well the programmes and the machine the products may be different. For example the rf-components (which are combining in new ways) have very strict characteristics, which is in no books. But it will be learned through the products of the clients. "*

However, some of the interviewed were critical to the clients also: sometime the clients do not know the possibilities of techniques and the firms must explain the clients.

Development projects are other important ways in upgrading the skills. Local developers like the sub-regional unit, technology centres or educational institute mostly initiate them. Centria seem to be the most crucial partner in these projects. According to one interviewed Centria as a project owner can combine the skills between different firms. In most successful cases, they could combine the knowledge and sell it to a client outside the region.

One development project concerning the development of the robotic tools was mentioned by many interviewed. When the firms are participating in this project, they can get knowledge and sometimes even funding so that they can search the new models and technological knowledge and adapt them in their production capabilities and practices.

The staffs of the interviewed firms learned also through specific education schemes and courses. Some interviewed pointed "*the active perceptions on the development of the field"*. They are evaluating the others; they are reading the professional journals. Especially the planning and R&D firms pointed the supply of information in internet. Internet is full of valuable technological knowledge, which can be adapted in the practice of the firms.

In planning and R&D the most important thing was the knowledge on the different production techniques. It is important to obtain the knowledge on production techniques, materials, production methods like forming methods and adapt them in the product planning. It is demanding to combine the different knowledge in the way that the solutions/result is functioning (from the point of view of clients).

New knowledge was gained through responding to the outsourcing processes of big clients. In the outsourcing, part of product development is shifting to the subcontractors, especially feasibility planning and the firms must respond to this process. One of the interviewed responded to this process by founding a new planning firm as a affiliated company with a big (Swedish-Finnish) engineering consultancy firm (project engineers). The knowledge and skills of the specific production (electromechanics) was combined with the skills of engineering and R&D. Also in other cases, the ownership has given access to the necessary new knowledge for the firms.

The interviewees expected lot of the knowledge of Oulu South Institute representing the Univesity of Oulu. The Institute has now grounded professors, research managers and research groups in the region as a response for the initiatives to the local developers.

3.6.3 Innovation activity

Organisational innovations are most common innovations among the firms. Five interviewed firms were quite new and the foundations were often regarded as innovations. Many spin-offs, entries and exits, fusions, mergers, closures and ownership arrangements seem to be typical in the sector and reflecting the turbulence of the sector.

Improvements of the production processes were mentioned as a second important type of innovation by the interviewed firms. The interviewed firms have applied new technology, for example information technology-based guiding system, and a quality system concerning the production process.

The firms had made also renewals in components. Two firms had innovation processes concerning products. One firm applied digital technology in its products. The other product innovation process was a result of combining different materials and technologies in the product.

Innovations seem to relate with each other at the firm level. The demands for growth and for high productivity force the firms to innovate. The outsourcing processes and the needs of clients are factors contributing to the innovativeness of the firms in electronics industry. The firms must be innovative in order to manage in the turbulent sector with global competition and dynamics. The cost reduction and competition can be seen as sources of innovation in the electronics industry in Oulu South. In addition, the overcapacity in some production capacities built around the years 2000-2001 is tightening the competition.

The knowledge and skills gained through experience and learning in work and learning by interacting seem to be a very important base for innovations. The good technological knowledge as well as the experience and flexibility of the firms and the staffs facilitate the innovative behaviour.

The main contributors for the innovations and innovative behaviour were clients (other firms in network) and Centria, the R&D unit of the regional polycentric.

Human and financial resources were mentioned as the most important bottlenecks of the innovation processes. The firms are operating in "time economy" were the time is often a scarce resource and the time for delivery is an important competition factor.

Many firms in electronics industry planned to make more product development in future. Some of them had plans for making more investments in research and development. However, the future prospects seem to depend on the market situation and the development course of the whole sector.

3.6.4 Co-operation and networks

Other firms are the most important partners for the interviewed firms. The same firms can be both partners in some respect and competitors in other respect at the same time. A localised industrial network of firms in electronics manufacturing has been developed in Oulu South during the last ten years. The network is a quite specialised manufacturing network consisting of different product families. However, the firms can operate at the same time in many "product families": they can be in the same time contract manufacturer to their main client and component producer in another product family.

The industrial network in Oulu South and most of the firms depend directly or indirectly on the clients outside the region. The most important client was still Nokia Networks[294]. The sector in Oulu South was founded due to the outsourcing processes of Nokia Networks about mid 1990s and the outsourcing process is the source of the dynamics for the sector.

[294] Nokia Networks is one unit of Nokia company. Other units are Mobile Phones, Enterprise Solutions and Multimedia. The electronics industry of Oulu South is integrated especially to the Nokia Networks' plants located in Oulu. Nokia Networks provides network infrastructure, service delivery platforms and related services to mobile operators and service providers.

The most important clients of the interviewed firms were two big contract manufacturers and system suppliers, which can be characterised as lead firms of the regions. These lead firms had their roots in Oulu South and they have expanded later being now multilocational firms. Being subcontractors of these systems suppliers the interviewed firms belong to the 2. or 3. layer supplier network of Nokia Networks. Some of the interviewed firms were also subcontractors in the value chain of ABB and other big firms.

According to the interviews, the big firms like Nokia Networks and ABB take the subcontractors through competition. The same seem to be the practice with the lead firms and other clients in the value chain.

The localised industrial network consists mostly of vertical relationships between the firms. The value chain related to the wireless technology is the most important. Besides the vertical relationships we found also horizontal co-operation between the firms, which are in the same position of value chain. However, this horizontal type of co-operation is weaker than the dominating vertical one.

The most important public sector partner of the interviewed firms was Centria, with which every interviewed firm had some co-operation. Other important partners were the local technology centres, actors of the centre of expertise programme, municipalities and sub-regional units.

Many firms planned to have more contacts to knowledge institutes in future. However, the life cycle of products is influencing the network building for the firms: the firms being forward in value chain need more contacts to knowledge producers.

The electronics manufacturing in Oulu South has a characteristics of an industrial district (dense network, common values, SMEs, co-operation and competition with each other) but the networking has still a vertical character with a dependency of one big firm.

3.6.5 Innovation conditions

Local milieu seems generally to encourage entrepreneurship in electronics manufacturing in Oulu South. There is a good relationship between the firms in the region. The positive attitude towards the firms developed especially after they succeeded to grow in agriculture dominated region during the last ten years. The success of the lead firms and the families around them has encouraged the interviewed firms to entrepreneurship. In addition, active municipalities, subregional units and other local actors were mentioned by the interviewed in facilitating the innovative behaviour. The vocational schools, polycentric and Centria, the research and development unit of the polycentric had actively responded to the needs of the firms. They also develop the sector in longer-term perspective. The Oulu South Institute is a new institution but the interviewees had lot of expectations to it.

The sector grew in Oulu South during the last ten years. The sector and the region had co-evolutionary development. Almost every interviewed mentioned the local pool of sector-specific skilled workers, which has developed in the region during ten years. In addition, also the specialised services responding to the needs of the firms developed in the regions. The interviewees mentioned especially transport and logistics firms serving the electronics industry firms in the region. The success of the lead firms and the families around them has

encouraged the interviewed firms to entrepreneurship. The more horizontal co-operation relationships are evolving in the region.

According to many interviewees, Oulu South and its industrial network has a good reputation inside the industrial network of the ICT cluster related electronics in Finland.However, some other firms pointed that the credibility of small rural firms in national ICT cluster is low.

Some of the interviewes mentioned the fact that some clients in southern Finland are quite far as a factor hindering innovation but the firms seem to have overcome this hinder. According to some other interviewees the regional state offices don't understand the needs of the sectors.

National conditions for innovations were mostly considered having to do with research and development activities. The national inputs to the research in ICT sector have been high but they have not so much been directed to the manufacturing plants located in rural areas like in Oulu South. The national cluster policy and the national programme of centre of expertise to which the electronics in case area has belonged since 2002 were the facilitating national factors mentioned by some of the interviewees.

3.6.6 Future prospects

According to the interviewees, the outsourcing processes will continue in future giving still possibilities for the entrepreneurship in Oulu South. The coercion to growth and is the characteristics for the sector. In future, the big international firms will decrease the amount of suppliers in order to have less and more effective corporate governance. According to one interviewed only the bigger suppliers will remain. It seems to be that the remaining suppliers will be regionally rooted and in Finnish ownership. The conclusion will be the polarisation between the firms so that there is in one hand big supplier firms and small specialised component producers.

The research and development input in the manufacturing firms will according to some interviewees increase and there is more applying university level research in the region.

The competition in the sector is harder every year, but the competition has been global for some time. According to one interviewed:

"*As long as there is in Finland planning and R&D in this branch and it is competitive we can grow and continue also in manufacturing but if Finland loose it position in this branch, we must be concerned of this business and then we must find something else*…"

3.7 Conclusions

Research context

In Finland, the technology policy has been emphasised more than innovation policy. Developing the national innovation system the interaction between research, industry and administration is emphasised. The non-science and non-technology based innovations have not been the first priority of the technology and innovation policy. The cluster policy has concentrated especially on developing the main national clusters such as forest cluster and ICT cluster. The other sectors, like tourism and food industry, are somehow in the shadow of the industries of priority.

However, the educational sector including the higher education is very much decentralised and regionally dispersed. The decentralised university and polytechnic system has been an important agent in regional development. The industrial policy as such is broad and the public business service system is comprehensive. The system consists of the support of both the state based and municipality based organisations. The regional programmes and development projects complete the support system.

Regional policy has shifted to multilevel and multi-actor development policy based on programmes and development projects. Structural Fund programmes have been even more important in Finland than in Sweden and Denmark. Structural Fund programmes are based on financial framework and wide partnership both in strategy planning and in implementation. The national and Structural Fund system can, however, be seen as an integrated whole. The national rural policy aims to response to the structural change in rural areas. It is based on an integrated development approach both at national and local level. At national level, the policy influences the actions implemented within and through the different administrative sectors. It is coordinated by the multi-sectoral Rural Policy Committee. The municipalities are very active in industrial policy. There are many municipality owned development agencies. The ongoing regionalisation process has strengthened the position of the municipality-based organisation.

The new jobs have mainly been generated in the biggest urban centres. Peripheral regions locate outside these centres. The peripheral regions are outmigration areas with high unemployment and problems with generating new jobs. The expanding and dynamic sectors are small in the peripheral regions.

Peripheral regions are in a marginal position in developing the national innovation system and they receive only small amount of the resources of science and technology policy. However, peripheral regions have been the targets of rural policy, regional development policy, educational policy and industrial policy.

The case study areas Central Ostrobothnia and Oulu South are specialised in primary production and manufacturing. Relatively small proportion of the population has higher education, but the proportion of people with secondary level education is relatively high. The case study of food industry in Central Ostrobothnia represents dairy production and different small-scale food production. The case study of tourism in Central Ostrobothnia represents a region where the sector is not a central focus, but which has a lot of potential for development in tourism. The electronics industry in Oulu South is related to the Finnish ICT cluster and our focus was to examine the role of rural manufacturing firms in this national cluster.

Empirical analysis

Firms and sectors

The size and organisation of the 29 interviewed firms varied as well as their market areas from local to national or even international. The suppliers were mostly regional. The production was mostly specialised: product niches in food and in tourism and a specialised position in industrial network in the case of electronics. All the firms in the food industry and tourism and seven out of nine firms in electronics had been generated locally. The owners were working in the firm in most of cases.

Knowledge base

The employees in all the three sectors had mostly low degrees. Learning by doing was important and the skills had been upgrading through the work experience. The strengths of the food and electronics industries were in production skills: in the food sector the knowledge of the raw-material and production were important, in electronics the technological skills. In the food sector mastering the production process and in electronics mastering the projects and networks were also quite crucial. In tourism the strength seemed to be the knowledge of the local culture and nature. Marketing was the main lacking skill in the firms.

In electronics there seemed to be a sector specific (technological) local education and knowledge infrastructure (vocational school, technical college and Centria/research and development unit of the polytechnic) which had been exploited by almost every firm in the sector. The role of local sector specific knowledge and education infrastructure seemed to be quite small in food industry and tourism.

Innovation activities

Product innovations in the food industry and tourism were the most important type of innovation, organisational innovations in electronics. Cost factor was important in innovation processes especially in electronics, demand and customer related factors in the food sector and environmental and cultural issues in tourism.

In all the sectors the knowledge and competence gained through experience and learning in work seemed to be an important base for innovations. Innovations seemed to be related to each other at the firm level in all sectors. Resources were the bottleneck in innovation processes in every three sector. The role of contributors varied in the firms. Generally, the firms seemed to need more contributors such as sector specific regional development agencies.

Co-operation and networks

Other firms were the most important partners for firms in all sectors. The firms in the food industry and electronics co-operated mostly with clients and suppliers, the firms in the food industry also with other firms in the same branch. The tourism firms cooperated with other firms in producing services and also with suppliers and sponsors. The firms in all the three sectors co-operated also with municipalities, regional state offices and development agencies. Centria was an important partner for the electronics industry.

Innovation conditions

Local milieu seemed generally to encourage entrepreneurship even if some firms in the food industry and tourism felt that the milieu is not supporting them enough. The firms in all three sectors seemed to be pleased with the supply of business services, like advice and funding. The firms in electronics pointed the local and regional sector-specific skill pool, which seems to be more moderate in food-processing and in tourism. The local conditions promoting innovations were the local raw materials in the food industry and the positive attitude to culture in tourism.

The local conditions preventing innovations seemed to be different in every sector: the electronics firms felt that some of the clients in southern Finland were too far and the tourism firms had difficulties to find services in local milieu. Tourism doesn't either belong to the main priorities in regional strategies and there is no clear body/development agency being responsible solely for the tourism development in the region. In the food industry there didn't seem to be any common hindering factors in terms of local conditions.

There didn't seem to be any common hindering or promoting factors in terms of national conditions in the food industry and tourism. In electronics the national cluster policy and the national programme of centre of expertise can be seen favouring the electronics in Oulu South.

Peripheral innovation system

In all the sectors, firms had specific competences and efforts to competence building. Generally, we found lot of innovations in every sector but we are hesitating to speak about a regional innovation system. From the case study sectors we found most the elements of a "local innovation system" in electronics in which we found a sector specific knowledge production institute, firms adapting the specific knowledge, and transfer mechanism (development projects, local development agencies, technology centres) in region. However, this sector is integrated in a bigger Northern Finland innovation system with a centre in Oulu. The programme of centres of expertise links the sector in Oulu South to the national level.

Neither food industry nor tourism has a sector specific knowledge production institutes in the case study region. There is no clear regional mechanism for transferring knowledge in tourism. In the food industry the knowledge transfer has been part of the tasks of one active development project in the region.

In the systemic point of view, we found both horizontal and vertical networks facilitating the innovation processes. The systemic aspect of innovations seemed to be quite sector-oriented. The geographical scope of the interaction relevant to innovation processes stretched from local and regional to national and international levels. Especially, the tourism industry is characterised with horizontal and the electronics industry with vertical networking.

Further development- strengthening the innovation activities

Food industry could be integrated more to sector specific knowledge production in other regions by strengthening the knowledge transfer mechanisms. There could be more development projects and a development agency in the food industry. Also more education possibilities in the region would strengthen the innovation activities in the food industry.

Tourism could be viewed more as a business and belong to the priorities of the regional strategies. The foundation of a regional tourism development agency with tasks of coordinating, marketing and transferring information and knowledge would enhance the knowledge base of the firms.

The electronics need more adapted research which could be used by the firms possible in the line of own products. The further regionalisation of the university would strengthen the integration of the sector to the Oulu –centred innovation system. The supplying agents should support the diversification of the production in the firms and try to decrease the dependency of the sector on one client. Also networking of local actors abroad is more important in future. The sector is vulnerable and the localised capabilities should be further strengthened.

3.8 Summary

The focus of the **food industry** was in the dairy industry, crop processing etc. in the region of Central Ostrobothnia. In terms of knowledge and competence the main strength was in production and it was in a large extent gained by experience. Formal education didn't play a significant role. New knowledge was mostly needed in marketing and financial administration.

Innovation activities were common and product innovations were the most common type of innovation. Products were regionally or nationally new. Also innovations in production processes and in marketing appeared. Most commonly the firms had implemented renewals themselves, but also cooperation appeared to some extent. Partners were generally other firms such as customers, suppliers or other firms in the same branch in the region or elsewhere. Most of the firms had utilised public support for example in funding. Some of the firms seemed to be more innovative than others, and common features for these firms were for example the following: innovation processes were related to each other at a firm-level; some of the innovations were clearly market oriented; firms had intensive networks, also abroad.

Lack of resources was the most common barrier for innovation. The knowledge and competence especially in production was the most common facilitating factor for innovation. No common hindering or facilitating factors for future innovating that had to do with local, regional or national surroundings were found.

The focus in **tourism** was on recreational services that focus on local culture or natural environment in the region of Central Ostrobothnia. The firms were diverse hence the field of education and the level of degrees varied a lot. The most important knowledge and competence in firms had mostly to do with producing services. This kind of knowledge had often been gained by long experience or by entrepreneur's own interests, for example knowledge of local nature surroundings. New knowledge was most commonly needed in marketing.

Innovations were common and for some firms innovation was clearly an ongoing process. Majority of the innovations had to do with products; innovations were either totally new products or improvements in products. Product innovations were usually either regionally or nationally new. Most firms operated mainly alone in their innovation processes. Some firms had intensive networks and cooperated in innovation activities, too. The main group of

partners were other firms, which mostly were situated in the region, but also elsewhere in the country and abroad, too. Some firms cooperated in producing services.

Most of the enterprises had utilized public support. Tourism as an industry is new in the region and it is not always seen as a real business. The region has potential in tourism, but an organisation for developing, coordinating and marketing is needed.

The selected manufacturing sector was **electronics industry**, which expanded in Oulu South since mid 1990s. The studied firms operated mostly in the value chain of wireless technology: contract producers, subcontractors, and component producers. In production firms the degrees of staff varied vocational degree being the most general. In planning firms the staffs were mostly engineers or technicians. The staffs' technological skills and knowledge on production methods was a basis for innovation. Learning in the work was important, especially through client's projects and orders. In addition, projects initiated by local developers were crucial. The firms needed more knowledge and skills on marketing as well as on specific technology.

Organisational and process innovations were most common innovations among the firms. The main contributors for the innovation were clients (other firms in network) and Centria, the R&D unit of the regional polycentric. The background of the innovations was often in the outsourcing process or in the needs of clients. The cost reductions forced the firms to innovate. Human and financial resources as well as the "demands of the time economy" were mentioned as major bottlenecks in innovation processes. The firms pointed the positive attitude of municipalities and other local actors towards the firms, the local and sector-specific skill pool of workers, the vocational school, polytechnics and Centria. The success of the lead firms and the families around them has encouraged the interviewed firms to entrepreneurship.

In electronics there seemed to be a sector specific (technological) local education and knowledge infrastructure (vocational school, technical college and Centria/research and development unit of the polytechnic) which had been exploited by almost every firm in the sector. The role of local sector specific knowledge and education infrastructure seemed to be quite small in food industry and tourism.

Conclusions

The case study of food industry in Central Ostrobothnia represents the milk production and different small-scale food production, but not the grain growing typical for the agriculture in Southern Finland. The case study of tourism represents a region, where tourism is not in a central focus, but which has a lot of potential for development in tourism.

Electronics industry in Oulu South relates to the ICT cluster, but it represents in some respects the manufacturing in the Finnish rural areas. In Finland, the big industrial enterprises are dominating the industry and large amount of SMEs belong to their subcontractors. Vertical integration and the problems of dependency and vulnerability are also typical in many rural areas of mechanical wood and engineering. The mechanical wood industry firms are building the networks through lead firms systems resembling the electronics in Oulu South. However, they can be isolated or located in a rural agglomeration. To build a localised industrial agglomeration, like the electronics in Oulu South, is a typical model for Ostrobothnian (Western Middle Finland) industry.

In all the sectors firms have specific competences and there are efforts to competence building. We found most the elements of a "local innovation system" in electronics, like a sector specific knowledge infrastructure, firms adapting the specific knowledge, and transfer mechanism (development projects, local development agencies, technology centres). However, this system is integrated in a bigger Northern Finland innovation system with a centre in Oulu. Neither food industry nor tourism has a sector specific knowledge production institutes in the case study region. There is no clear regional mechanism for transferring knowledge in tourism. In the food industry the knowledge transfer has been part of the tasks of one active development project in the region.

The innovation activities of food industry could be strengthened by developing the knowledge transfer mechanisms, by promoting the development projects and other initiatives as well as offering more education. Tourism could belong to the priorities of the regional strategies. The foundation of a regional tourism development agency with tasks of coordinating, marketing and transferring information and knowledge would enhance the knowledge base of the firms.

The electronics need more adapted research which could be used by the firms possible in the line of own products. The development agents should support the diversification of the production in the firms and try to decrease the dependency of the sector on one client. Also networking of local actors abroad is more important in future. The sector is vulnerable and the localised capabilities should be further strengthened.

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CHAPTER 4: Case studies from Iceland

4.1 The research context

4.1.1 Rural Iceland

Iceland is Europe's most sparsely populated country[295]. Almost four-fifths of the country are uninhabited and mostly uninhabitable. The interior of the country mostly consists of barren highlands, lava fields, glaciers, mountains and volcanoes. The population is to a large extent concentrated in a narrow coastal belt and in valleys extending from the coast.[296]

The population of Iceland is just over 290.000, of which over 62% lives in the capital city (Reykjavík) and seven surrounding municipalities, which are situated in the southwest part of the country (the capital region)[297]. The remaining 38%, or 110.000 people, live in towns along the coast, other small urban centers, as well as in sparsely populated farming communities. Most areas of Iceland, apart from the capital region, have experienced considerable out-migration in the last few decades. The highest out-migration numbers are seen in Westfjords region (about 24% of the population in the period 1980-2002) and in the Northwest region and the East region (a decrease between 9% and 13%). Respectively the population of the capital region has grown considerably in the same period (about 50%).[298]

Statistics Iceland[299] defines an *urban* community as a cluster of houses with at least 200 inhabitants and with a distance between houses generally not more than 200 meters. A s*parsely populated or a rural* community is by this definition an inhabited area, which is not urban. According to this definition, close to 21.300 Icelanders live in communities that are considered sparsely populated in 2002, which equals just over 7% of the Icelandic population[300]. However, if we look at the regional level, the picture is somewhat different. Based on OECD rural development programme's definition of rural regions and Statistics Iceland's division of Iceland into regions, six out of eight regions of Iceland can be categorized as significantly rural[301]. The other two regions would be categorized as predominantly urban. It should be noted that a common approach for geographical division of Iceland is to use a two- category-division, which is partly based on population density, i.e. 1) the capital region, and 2) the rest of the country; the latter usually referred to as *landsbyggdin* in Icelandic.

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[295] With only 2,8 persons per km² (Hagstofa Íslands. 2003b).

[296] Hagstofa Íslands. 2003b.

[297] Hagstofa Íslands. 2003a.

[298] Hagstofa Íslands. 2003a. [AND] Hagstofa Íslands. 1997.

[299] The Icelandic name for Statistics Iceland is 'Hagstofa Íslands'. The Icelandic version is repeatedly used in the list of references.

[300] Hagstofa Íslands. 2003a.

[301] OECD Rural Development Programme's definition of *rural* is based on a division between two levels of geography: 1) the local community and 2) the region (OECD, 1994). A community is defined as a small basic administrative or statistical area, which is either rural or urban, based on a similar definition as the one of Statistics Iceland referred to above. A region is defined as a larger administrative or functional area, providing "*the wider context in which rural development takes place*" (OECD, 1994, p. 20). Regions are categorized into three types, depending upon what proportion of the region's population lives in rural communities. These are 1) predominantly rural regions, with more than 50% living in rural areas, 2) significantly rural regions, with 15-50% living in rural areas, and 3) predominantly urban regions, with less than 15% living in rural areas.

Iceland has a strong economy, low unemployment, and low inflation, all which contribute to one of the highest standards of living in the world. The rich fishing banks around the island as well as the abundant hydro and geothermal power are Iceland's most valuable natural resources. The economy depends heavily on the fishing industry and marine products constituted 62,9% of Iceland's income from exporting of goods in the year 2002[302]. Another important industry is the aluminum industry, which accounted for close to 20% of the income from exporting of goods in the year 2000[303]. Tourism is also an important industry as a rapidly growing foreign currency contributor.

Employment by industry sectors in Iceland has changed in accordance with the development of other industrialized societies. Technological advancements have led to a decrease of employment in the more traditional sectors such as agriculture, fisheries and fish processing, while employment in various services, including tourism, has expanded. In 2002 over 70% of the Icelandic workforce where employed in various service industries, while agriculture, the fisheries and fish processing altogether only accounted for just over 10%[304]. It should be noted that in many communities and regions outside the capital area, employment in agriculture, fisheries, and fish processing is still fairly high, i.e. 36% in the Westfjord region and 25% in the Northwest region[305]. These industries are, therefore, still important contributors of jobs in many of the rural regions.

4.1.2 Profile of the Northwest region

The Northwest region extends from Hrútafjörður fjord and Hrútafjörður river in the west to Hvannadalsbjarg cliff between the fjords of Héðinsfjörður and Ólafsfjörður in the east. Its south border lies through Hofsjökull glacier, Kjölur highland and Arnavatnsheiði highland. The total area of the region is around 12.000 square kilometers[306]. There are two main districts in Northwest Iceland: 1) East and West Húnavatnssýsla district, which is located further to the west and 2) Skagafjörður district, which constitutes the east part of the region. Highway one passes through the Northwest region, the distance from the west boarder of the region to the east boarder along the highway is 181 km. The driving distance from Iceland's capital city Reykjavík to the west boarder of the region is 159 km. Figure 1 shows the geographical position of the North West region of Iceland.

[302] Hagstofa Íslands. 2003a.
[303] Hagstofa Íslands. 2003a.
[304] Hagstofa Íslands. 2003a.
[305] Hagstofa Íslands. 2003a.
[306] Ólafur Arnalds et.al. 1997.

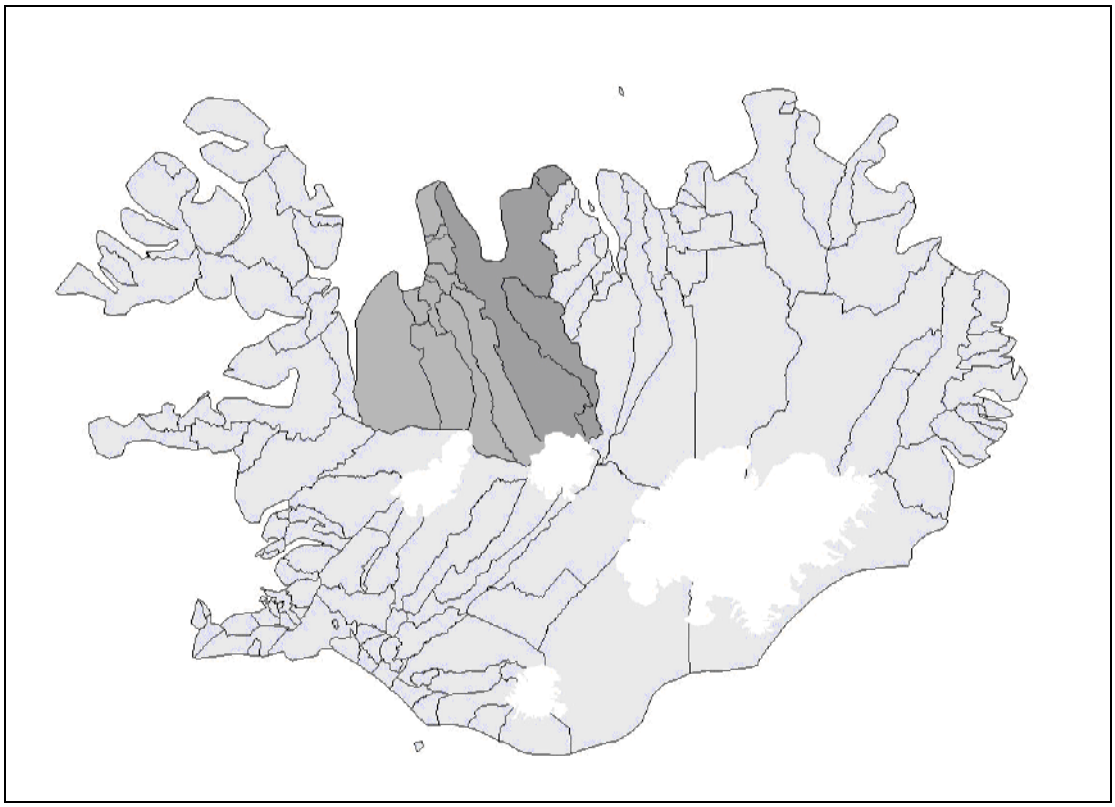


Figure 1: Location of the North West Region of Iceland (dark area)

The population of the Northwest region was 9.151 in December 2003. The region includes five communities that are classified as urban. These five urban communities account for approximately 6.100 people or roughly 67% of the population of the region. The rest of the population, or roughly 33%, lives in either small centers (of 80 to 190 people) or in sparsely populated areas (these two habitat forms are, as mentioned earlier, are classified as rural).[307] In fact the Northwest region is the region in Iceland that has the highest proportion of the population living in rural settings. The rural areas and the urban center are interlinked in many ways through the interchange of goods, services, and people. Agricultural products (raw materials) are transported from the rural areas for processing in the urban centers. Rural residents also utilize various services in the centers and in some cases commute to the nearest center for employment. The course of development of the rural and urban communities is therefore strongly connected.

The population of the Northwest region has been slowly declining in the last couple of decades. In 1980 the population of the region was 10.631 but in 2003 it had gone down to 9.151 (close to 14% decrease). The communities that have experienced the most decrease in recent years (1997-2002) are Siglufjörður (2,3% decrease), Blönduós 2,1% decrease) and Húnaþing vestra (1,7% decrease).

The region is divided into 12 municipalities some of which include a town (an urban center) and a sparsely populated area. Table 1 lists the municipalities of the North West region of Iceland and their population number.

[307] Hagstofa Íslands. 2004.

Municipalities		Population number
Siglufjörður	Urban	1438
Sveitarfélagið Skagafjörður (including the town of Sauðárkrókur)	Urban/rural	4178
Akrahreppur	Rural	229
Húnaþing vestra (including the town of Hvammstangi)	Urban/rural	1175
Áshreppur	Rural	75
Sveinsstaðahreppur	Rural	91
Torfalækjarhreppur	Rural	93
Blönduóssbær (including the town of Blönduós)	Urban/rural	958
Svínavatnshreppur	Rural	119
Bólstaðarhlíðarhreppur	Rural	113
Höfðahreppur (generally referred to as Skagaströnd)	Urban	585
Skagabyggð	Rural	97
		Total **9151**

Table 1: Municipalities within the Northwest region and their population number. ***Source: Hagstofa Íslands, 2004a.***

The first three municipalities that are listed in the table above belong to the Skagafjörður district and the rest to the East and West Húnavatnssýsla district.

The five largest centers are Sauðárkrókur, Siglufjörður, Skagaströnd, Blönduós and Hvammstangi. Figure 2 shows the geographical structure of the region as well as the location of the major centers. The town of Sauðárkrókur in Skagafjörður district is the largest town of the region, with a population of roughly 2.600. The town is a center of public administration, commerce, services and education in Skagafjordur district and to some extent also the Northwest region. A few state-run service organizations are also located in Sauðárkrókur, e.g. the Institute for regional development, the Horse center of Iceland and a branch of the Housing financing fund.

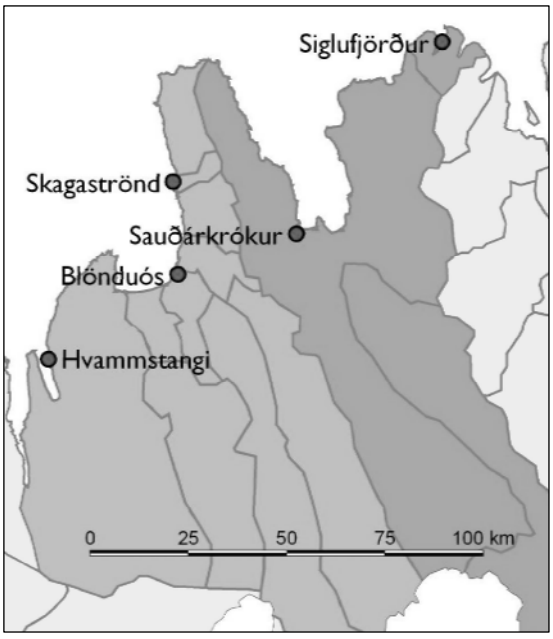


Figure 2: Geographical structure of the study region and the location of major centers.

Food processing is also an important industry in the town of Sauðárkrókur, both in the field of marine products and agri-food products. A strong cooperative (Kaupfélag Skagafirðinga: KS) is run in the Skagafjorður district. KS is the key player in food processing in the district with its main operations in Sauðárkrókur. The cooperative runs a slaughterhouse, a meet processing branch, and a dairy. It is also involved in processing of various marine products. Siglufjörður is another urban center, located at the east border of the Northwest region. It has a population of 1.430. One of Iceland's best harbors is in Siglufjörður and the fisheries are the back bone of the local economy. Three other small centers are located in the Skagafjörður district. These are Varmahlíð, Hofsós and Hólar. Hólar College is a research, development

and educational institution run by the Ministry of agriculture. Its primary fields are aquaculture, rural tourism and horse breeding and training. Hólar College is the only educational institute in the region, which offers university programs.

East and West Húnavatnssýsla district includes three communities that are can be considered urban. The largest one is Blönduós with a population close to 900. Blönduós is a service center for the surrounding area but is also a food processing center. A dairy, a slaughterhouse, a shrimp processing plant and other small food processing firms operate in the town. Hvammstangi, a community of approximately 580 people is the urban center located furthest to the west within the region. Similar to Blönduós it is a service center for the neighbouring farming communities. Shrimp fishing and shrimp processing is of prime economic importance for the community, along with fisheries that are based on small vessels. A slaughterhouse and knitting- and sewing factory are also important employers in the community. The third urban community in district is Skagaströnd. Skagaströnd has a population of approximately 580 and is heavily depended on the fisheries.

As seen from above, the Northwest region is in a traditional sense a food production region. The area is well suited for agriculture and also has strong tradition in the fisheries. Currently around 25% of the employed persons in the region work in agriculture, the fisheries or fish processing. This is a considerably higher proportion than the national average. As in other regions of Iceland, various services nevertheless account for the largest proportion of the labour force. Tourism is becoming an increasingly important industry in the region, especially various action-based and recreational services. Table 2 shows the division of employed persons in the region by industry sectors.

Economic activities (industry sectors)	**Employment by economic activity (% of employed persons)**	
	Iceland	***Northwest region***
Agriculture	3%	11%
Fishing	4%	5%
Fish processing	4%	8%
Manufacturing except fish processing	11%	10%
Electricity & water supply	1%	1%
Construction	7%	7%
Wholesale, retail trade, repairs	14%	10%
Hotel, restaurants	4%	2%
Transport, communication	7%	4%
Financial intermediation	4%	3%
Real estate &business services	8%	3%
Public administration	7%	11%
Education	7%	6%
Health services, social work	15%	12%
Other services and not specified	7%	5%

Table 2: Employment by economic activity (% of employed persons) in the Northwest region and in Iceland as a whole. ***Source: Hagstofa Íslands, 2004b.***

4.1.3 Few facts on the agrifood industry in Iceland

Although agriculture is not today one of Iceland largest sectors in regard to proportional contribution to the country's GDP[308], the country is self-sufficient in the production of meat, dairy products, eggs and to a large extent also in the production of certain vegetables. Although currently only about 4% of the Icelandic workforce is employed in agriculture[309], some agriculture activities are found in all lowland areas around the island, and the industry is still the backbone of local economies in most of the sparsely populated areas of the country. Many people are also involved in farming although receiving their main income from other sources.

Currently there are about 3.300 farms in Iceland (including all types of farms, cattle farms, sheep farms, etc.)[310]. The number has somewhat decreased in recent years, with a trend towards fewer and larger operating units. Icelandic farms are, nevertheless, still small on an international scale, and most units are run as family-farms. Icelandic farms are usually highly mechanized. The income of farmers is rather low compared to other occupational groups[311].

Traditionally, as well as presently, agriculture in Iceland is based largely on livestock farming. Cattle farming (milk and beef production) is by far the biggest branch within Icelandic agriculture, with aggregate turnover of 8,7 billion ISK[312] in 2002 or 47% of the total turnover of Icelandic agriculture[313]. Sheep farming is next in line with a turnover of almost 4,1 billion ISK and a 22,1% share[314]. The most common form of farming in Iceland is the so-called mixed animal husbandry, which usually consists of a mixture of cattle and sheep farming. Specialization has, however, increased significantly in recent years. A considerable number of farmers now raise pigs, poultry or horses, or produce eggs or vegetables exclusively. In the most sparsely populated areas, such as the Westfjords and some parts of East Iceland, agriculture is mostly limited to sheep farming.

Since the interior of Iceland mostly consists of barren highlands, glaciers, and lava fields, only around 15.500 km^2, or 15,5% of the total land area of Iceland, is arable. Of this area only around 1.500 km^2 have been cultivated (1,5% of the total land area)[315]. Apart from growing of potatoes and a limited range of vegetables, farmers in Iceland mostly concentrate on the cultivation of perennial grasses for hay and silage for feeding of livestock. Conditions for grain growing are difficult due to the short summers and cool climate, although barley is cultivated for animal feeding in some parts of the country.

Changes in the legal and quasi-legal environment concerning agriculture in the last decade or so have generally focused on increasing efficiency of production, the relaxation of production and price control, as well as on liberalizing import control in connection with Iceland's EEA-membership and the WTO-agreement[316]. Also some policy efforts have been targeted towards diversification of the industry. Official grants are now available for a broader range of

[308] According to Hagstofa Íslands (2003a), agriculture accounted for 1,5% of Iceland's GDP in the year 2002.
[309] Bændasamtök Íslands. 2004b.
[310] Bændasamtök Íslands. 2004b.
[311] Bændasamtök Íslands. 2003c.
[312] Exchange rate: ISK / 87 = Euros.
[313] Bændasamtök Íslands. 2004b.
[314] Bændasamtök Íslands. 2004b.
[315] Bændasamtök Íslands. 2004b.
[316] Bændasamtök Íslands. 2004a.

production and agricultural activities. Development efforts have also aimed at encouraging utilization of resources such as fishing in lakes and rivers, collecting eider down, drift wood, etc. Fish farming and tourism are also industries that farmers have increasingly got involved in for the purpose of supplementing their income[317].

Milk production

Milk is produced in some extent in most regions of Iceland. However, in some regions the production is more concentrated than in others, with the South region and certain parts of the Northwest and Northeast regions leading the way in terms of number of farms and production quantities. Milk production in Iceland is solely based on the use of a specific Icelandic breed of cattle. It is a hardy and fertile type of cattle, which is slightly smaller than cattle in neighboring countries. Cows are kept in barns for eight months of the year and are mostly fed on dry hay and silage. The most productive milk cows also receive feed concentrates. Cows are put out to pasture in the summer[318].

At the end of the year 2003 there were 893 farms producing milk in Iceland, with a total production quantity of 108.384.000 liters. The average production quantity per farm was 121.371 liters and the average number of cows per farm was 24,8. The total production has gone slightly up in the last few years and at the same time the number of farms has gone steadily down. In 1991 there were 1.509 farms producing milk and in 1998 the farms were 1.185. This translates into over 40% decrease in the number of farms in the period from 1991-2003. As seen from these figures the average production of farms has grown considerably or from 69.920 liters in 1991 to 121.371 liters in 2003 (an increase of 74%).[319]

A state law on the production, pricing and sales of agricultural products (No. 99/1993) indicates that the Minister of Agriculture, on behalf of the Government of Iceland, and the Farmers Association of Iceland, shall make an agreement on the operating environment for milk production. In this agreement the parties negotiate the government's support for milk production, customs protections and the main rules of the industry game.[320] The current agreement is valid until the first of September 2005. Under the current agreement milk production in Iceland is controlled through an official quota system. According to the agreement, farmers receive a so-called base price for their production (per liter)[321]. This price is built up from two sources: 1) the state treasury pays the farmers 47,1% of the base price (subsidies), usually referred to as direct payments, and 2) the processing firm, i.e. the dairy plant, pays 52,9%.In order to receive the direct payments, each registered farm has to hold production rights. The production rights are generally referred to as a support target or a quota. The target specifies the quantity of milk, measured in liters, that entitles the holder to a direct payment from the State Treasury. Milk that is produced beyond the support target of each farm does not, in a nutshell, receive any subsidies from the state.[322]

[317] Sigurgeir Thorgrimsson, the director of Bændasamtök Íslands. [year missing].

[318] Bændasamtök Íslands. 2004a.

[319] Nefnd um stefnumótun í mjólkurframleiðslu. 2004.

[320] Lög um framleiðslu, verðlagningu og sölu á búvörum. No. 99/1993.

[321] Currently ISK 80,74 per liter.

[322] Agreement on the Operating Environment for Dairy Production. 1997.

The total support target of milk is determined on an annual basis by the Minister of agriculture. The decision is based on the consumption of domestic dairy products processed through dairy plants in the last twelve months and the estimated dairy consumption for the coming year made by the Farmers Association of Iceland, with regard to supplies. This total support target is then divided between milk producing farms in the country, based on their proportional share of the total support target last year.[323]

Quotas are freely tradeable between operators of registered farms, regardless of farm location (i.e. regardless of boarders of operational areas of dairy plants or geographical regions). In September 2004, the market prize for quota allowing for production of one liter of milk per year was approximately ISK 250[324]. For an average sized farm (producing 121.371 liters) the market value of the corresponding production rights is therefore around ISK 30 millions. Based on the September market values, this amount is about the same as the value of farm sufficiently big for an average production (including land, buildings, livestock and machinery).

Milk is the only agricultural product in Iceland that official price administration applies to. The minimum price for milk is decided in a pricing base that is formulated by a state-appointed committee, i.e. the Pricing Committee of Agricultural Products. The committee also decides upon the wholesale price of milk and basic products.

The dairy industry

At the end of the year 2003 there were nine dairy plants operated in Iceland. In the last decade or so the number has gone considerably down due to reorganization processes within the industry for the purpose of reducing costs and facilitating more efficient use of production capacity. The dairies are located in different regions of the country. As the general rule, each dairy plant processes milk that is produced in the plant's neighboring area. Figure 3 shows the location of the different plants.

A vast majority of firms in the dairy industry are run in the form of cooperatives, which are owned by farmers. The dairy plants are very different in size in regard to quantities processed. The largest one, Mjólkurbú Flóamanna in Selfoss in the South region, receives 38% of the milk produced in the country, while the smallest one, Mjólkursamlag Vopnfirðinga in the East region, processes 0,7% of the total production.



Figure 3: Dairy plants in Iceland. ***Source: Samtök afurðastöðva í mjólkuriðnaði 2004*.**

The firms also have extensive cooperation among each other. They are all members in a specific industry association called the association of dairy plants (SAF)[325]. They also jointly

[323] Agreement on the Operating Environment for Dairy Production. 1997.

[324] The quota price is constantly rising.

[325] Samtök afurðastöðva í Mjólkuriðnaði (SAF), in Icelandic.

run a sale and marketing firm, the Icelandic Dairy Produce Marketing Association[326], which is responsible for sales and distribution of spreads, cheese and milk powder. The Dairy Laboratory of Iceland is also run as a joint initiative of all the firms in the industry. It handles all kinds of testing, chemical analysis, and research on dairy samples and various quality management related task.[327] Finally the different firms in the dairy industry have come to terms with as specific division of tasks, where each of the plants specializes in the production of specific dairy products. In a nutshell the firms that are located furthest from the capital region have put a strong emphasis on products that have less volume (e.g. cheese, butter, and milk powder) while the firms that are located in or closer to the capital region have focused on various fresh products such as fresh milk and skimmed milk.[328]

Icelandic milk and dairy products are almost solely consumed domestically. Export of dairy products has been very limited after export compensations were abolished in 1992. Import has on the other hand been increasing in the last few years, although it is still not very much overall and mainly restricted to cheese and yogurt. [329]

4.1.4 Few facts on the agrifood industry (milk production and the dairy industry) in the Northwest region

One part of the criteria for the selection of focus for the aspects of this research project (cases), which deal with agri-food production, was that at least two links of the value chain (production and processing) had to be located within the chosen study region. In the case of the Northwest region, milk that is produced on farms in the most western part of the region (West Húnavatnssýsla) is processed in Búðardalur, which is located in the neighboring region, i.e. the West region. The following discussion of the dairy industry in the Northwest region will, therefore, only refer to the Skagafjörður district and the Eastern part of Húnavatnssýsla district.

In June 2004 there were a total of 94 dairy farms in the study region with a total of 2.703 dairy cows (average number throughout the previous year). The production is more condense in the east part of the study area (Skagafjörður district) both in regard to number of farms and the average size of farms. In June 2004 there were 35 farms with 22,5 dairy cows on average in the East Húnavatnssýsla district, while there were 59 farms in Skagafjörður with a 32,5 dairy cows on average. At the same time the average size of a dairy farm in Iceland was 27,9 cows per farm. In fact only one other district in Iceland (Eyjafjörður district) has larger average size of dairy farms than Skagafjörður district.[330] The total production of milk in the study area in the year 2003 was 14.597.212 liters of milk, of which 10.502.060 liters, or 72%, where produced in Skagafjördur district. As seen in Table 3, milk production in the study region has increased considerably in the last decade. The increase has been proportionally larger than the increase in the national production. However, as also can be seen in Table 3, the industry has been expanding to a much greater extent in Skagafjörður District than in the Western part of the region.

[326] Osta og smjörsalan sf. in Icelandic.
[327] Samtök afurðastöðva í mjólkuriðnaði 2004.
[328] Nefnd um stefnumótun í mjólkurframleiðslu. 2004.
[329] Nefnd um stefnumótun í mjólkurframleiðslu. 2004.
[330] Bændasamtök Íslands. 2004c.

	Production 1993 (liters)	Production 2003 (liters)	Change
Iceland as a whole	99.915.000	108.384.000	8,5%
The study area	11.535.000	14.597.000	26,5%
Skagafjörður district	7.834.000	10.502.000	34,0%
East Húnavatnssýsla district	3.701.000	4.095.000	10,6%

Table 3: Development of milk production quantities in the study area in the period 1993-2003 in comparison to the development of the national production. ***Source: Samtök afurðastöðva í mjólkuriðnaði 2004.***

As seen on Figure 3, page 220, two dairy plants are located in the Northwest region, one in Sauðárkrókur and one in Blönduós. These are Mjólkursamlag Kaupfélags Skagfirðinga, hereafter referred to as MKS, and Mjólkursamlag Húnvetninga, hereafter referred to as MH. The total annual turnover of the two dairy plants is close to 1.200 millions ISK[331].

MKS is run by a local cooperative (Kaupfélag Skagfirðinga, KS). It was established in the year 1935 and processes all milk produced in the Skagafjörður district. MKS's primary focus is on several types of cheese. It also has a well-established product line of flavored sour milk. The cheese and the sour milk products are distributed nationally. MKS also produces fresh milk and cream for the local market. Currently the employment created by MKS is around ten man-years.

MH is run by Mjólkursamsalan, which is a large dairy operation, which runs plants in several locations in the country (head quarters in Reykjavík). Mjólkursamsalan was initially founded as a cooperative of farmers in the Southwest part of Iceland and MH was established in 1947 as a local cooperative, owner by farmers in East Húnavatnssýsla district. Mjólkursamsalan and MH merged in 1999 and MH is currently run as separate division of the company[332]. MH has from its beginning put the strongest emphasis on the production of milk powder which is used both for human and animal consumption and distributed nationally. Butter of various sorts is also an important product for MH and the plant is the only producer of flavored butter in Iceland. Finally MH produces skyr (a special Icelandic yogurt-like product) for national distribution. Currently the employment created by MH is around nine man-years.

4.1.5 Few facts on rural tourism in Iceland

The Icelandic Tourist Board defines tourism as an economic sector that includes all firms and individuals that operate in or are associated with traveling. This broad definition includes a wide range of firms, including travel sales corporations (whole sale and retail), travel organizers, transportation companies, accommodation establishments, travel guides, etc.[333] In this project, however, the focus will be on operations that are in the business of offering recreational services to tourists. In that way, operations that utilize special aspects of the study areas' culture and natural environment would be put at the center.

[331] Exchange rate: ISK / 87 = Euros.

[332] A representative of the head quarters of Mjólkursamsalan was interviewed in relation to the primary data gathering of the ISP project. When asked about Mjólkursamsalan's future plans for the MH operation, he responded that, in his view, the future of MH's operation, from a long term perspective, was uncertain.

[333] Ferðamálaráð Íslands. 2004a

Tourism is currently the second largest foreign currency earner within the Icelandic economy after the fisheries (13% of the country's export income in 2002)[334]. It is estimated that tourism provided around 5.400 jobs in Iceland in the year 2002.[335] In the year 1999, 3,9% of the Icelandic labour force were employed in the tourism sector and at the same time it was estimated that the industry contributed around 4,4% of the gross domestic production. The number of jobs in the industry has increased by 2,3% per year on average since 1973. It should, however, be noted that the contribution of tourism in regard to total employment in the country has only grown by 0,03% per year, on average in the same period. The growth of tourism is, therefore, about equal as the growth of employment in the country as whole.

The number of tourists that visit the country from abroad has grown by 6% on average per year since 1960. This equals that the number has doubled every 12 years.[336] In the year 2003, 320.000 tourisms visited Iceland from a broad, which is the highest number of visitors recorded for a single year. [337] The largest groups of visitors come from the Nordic countries, USA, Canada, UK and Germany.[338]

Attractions, seasonality, and geographical distribution of the industry

Tourism is a part of the economic structure of all regions in Iceland. Traditionally the main tourist attractions have been the remarkable landscape of the country and the vast selection of natural phenomena, such as waterfalls, lakes, lava, rock formations, etc. Those regions that are rich in this regard, therefore, traditionally have been the most popular among tourists. Foreign visitors have also become increasingly more interested in various recreational activities connected with nature and culture and there has been a dramatic increase in the activities offered in this regard. The results of a survey of the Icelandic Tourist Board, for the year 2002, show that around 76% of tourists that visit the country in the summer, name interest in Icelandic nature as an influential factor for their decision on traveling to Iceland. An interest in the country's culture and history is the second most commonly mentioned motivating factor by summer visitors. [339]

Tourism in Iceland is very much a seasonal phenomenon, with the high season extending over the period from middle of June to the end of August. The number of overnights stays, which are bought from Icelandic accommodation service providers, in the high season periods is around five times higher than the corresponding number for the low season period. The seasonality within the industry is, however, even greater in regions outside the capital region. This stems primarily from the facts that only a small proportion of tourists from abroad, who visit Iceland over the low season period, visit areas outside the Capital region.[340]

Due to a lack of official data it is hard to estimate the number of firms within the tourism industry in Iceland. This is partly because of the fact that the classification of economic

[334] Ferðamálaráð Íslands. 2003.

[335] Ferðamálaráð Íslands 2003.

[336] Hagfræðistofnun. 2004a.

[337] Ferðamálaráð Íslands. 2004b.

[338] Ferðamálaráð Íslands 2003.

[339] Ferðamálaráð Íslands 2003.

[340] Hagfræðistofnun. 2004a.

activities[341] that is used by Statistics Iceland, which is the official agency responsible for official business registration, does not include tourism as a special category. Also only a proportion of Icelandic tourism operators hold membership in the Icelandic Travel Industry Association (SAF). The member register of SAF, therefore, does not give an accurate picture of the number of firms in the industry. What probably comes closest to a realistic number is the Icelandic Tourist Board's registry[342]. However, since registering with the Tourist Board is not mandatory, the Board's register is not fully exhaustive. The registry currently includes close to 900 tourism operators nation wide[343].

One way to look at the geographical intensity within the industry is to look at statistics on overnight stays sold by registered accommodation sellers in different regions of the country. Statistics Iceland collects such data on an annual and monthly basis. According to this data, the total number of overnight stays in 2003 was 1.984.448. This was a 6,7% increase from the year 2002. Majority of overnight stays, or 61,2%, occurred in areas outside the capital region. However, if we look only at overnight stays by Icelanders, 88,4% of stays occurred in areas outside the Capital region while just around half (49,2%) of foreign visitors overnight stays took place in the areas outside the capital region. As seen by these figures tourist visits in Iceland do not spread evenly through out the country. The overnight stays in areas outside the capital region are also not evenly distributed between the different areas. The most overnight stays, in rural Iceland in 2003, were in South Iceland (383.517, or around 19% of all overnight stays in the country), Northeast Iceland (312.329, or 16% of all overnight stays in the country) and East Iceland (197.659, or 10% of all overnight stays in the country).[344]

There is ample supply of accommodation of various sorts in Iceland. This also applies to areas outside the Capital. The occupancy rate for hotels and guesthouses in the Capital region has been high during high season (June, July, and August), or up to over 80% in August 2003, and has also gone significantly up during low season. At the same time the occupancy rate during high season has been around 60% or less in areas outside the Capital region.[345]

As noted earlier, employment in the more traditional industry sectors such as agriculture, fisheries and fish processing, in Iceland, has been decreasing in the last decades. The general discussion of rural economic development has highlighted the role of tourism development as a mean towards diversification of rural economies. Studies have shown, however, that tourism development in the rural areas commonly faces serious challenges. In some remote areas of Iceland tourism has very much been on the agenda, but attracting tourist has turned out be far more complicated than expected.[346] Tourism enterprises, even in areas that have experienced a steady increase in the flow of tourists, also are faced with severe challenges. To name some examples, low turnover, which at the best allows for minimum wages and zero return on investments seem to be quite common among the smaller enterprises. The seasonality within

[341] Statistics Iceland uses an Icelandic version of NACE rev.1.

[342] Ferðamálaráð Íslands. 2004c.

[343] In addition to accommodation and recreation service firms, the register includes various other operations, such as swimming pools, museums, car rentals, transportation firms, travel agencies, etc. (Note the register does not includes restaurants).

[344] Hagstofa Íslands. 2004c.

[345] Hagstofa Íslands. 2004c.

[346] Gunnarsdóttir. 2003.

the industry also poses some challenge for the management of human resources and the stability of cash flows. Finally, access to development grants and business loans with acceptable interest rates, especially for firms that solely focus on providing recreational services, seem to be quite poor.[347]

Tourism promotion and marketing

The Icelandic Tourist Board (ITB) is the governmental institute officially in charge of tourism development in Iceland. The Board adheres under the Ministry of Communications. The two most evident players in promotion of tourism internationally, for the last two decades, have been the Tourist Board and Icelandair (a private airline company). The Board has mostly concentrated on the basic promotion of Iceland as a tourist destination. Private operators and local and regional interest groups, associations and authorities have therefore, mostly carried out product development and promotion targeting different regions of the country.[348]

4.1.6 Few facts on tourism in the Northwest region

Tourism is becoming an increasingly important industry in the Northwest region, especially various action-based, culture-based and other recreational services. The tourism industry in the region relies on organized activities and events as an attraction for tourists to a greater extent than many other regions of the country, although the region's nature and landscape also is a resource in this regard[349]. The Western part of the region (East and West Húnavatnssýsla district) is renowned for salmon and trout fishing. The region as a whole, especially the Eastern part (Skagafjörður district) has strong tradition for tourism activities associated with horseback riding and the Icelandic horse. Cultural tourism is also an important part of the tourism landscape of the Northwest region. The area has rich history, which has contributed to the development of various development projects through out the region. Several museums and cultural centers operate in the region focusing on different aspects and time periods of the region's history and traditions.

As with the situation at the national level, the lack of statistics makes it hard to estimate the exact number of operators within the tourism industry in the region. The Icelandic Tourist Board registry[350], however, included around 115 tourism firms that are located in the Northwest region[351]. Most of these firms are very small and many only operate during the summer months. It seem reasonable to say that the region possesses a fairly large group of firms offering unusually broad range of recreational services, in comparison to other areas outside the capital region. These include for instance firms offering various forms of salmon and trout fishing, guided walking tours, river rafting, jeep tours, boat tours, riding tours, etc.

In 2003 the total overnight stays sold by accommodation establishments in the Northwest region were 69.053, which is 3,5% of the total number of overnight stays sold in Iceland that

[347] Samgönguráðuneytið. 2003.

[348] Gunnarsdóttir. 2003.

[349] Ferðamálaráð Íslands. 2002.

[350] Ferðamálaráð Íslands. 2004c.

[351] Since registering with the Tourist Board is not mandatory, the Board's register is not fully exhaustive. In addition to accommodation and recreational service firms the register includes swimming pools, various museums and highland cabins.

year. This equals 5,1% increase from the previous year. Around half of the overnight stays was bought by Icelanders (34.717, or 50,3%), but the other half was bought by foreign visitors (34.336, or 49,7%).[352] According to a recent study the seasonal difference within the annual tourist flow is more drastic in the Northwest region than in any other region of the country.[353] The number of overnights stays, which were sold by accommodation establishments in the region, in the high season period, is around 34 times higher than the corresponding number for the low season period. Considering these figures it is not surprising that the average annual occupancy rate for the year 2003 was only 28% in the Northwest region, reaching the lowest in January (5%) and the highest in July (62%). As also seen by these figures there seem to be sufficient, if not excess supply of accommodation services in the region.

4.2 Selected issues in policy and institutional initiatives

A single direct governmental policy framework, including every aspect of the broad spectrum of innovation, does not exist in Iceland. However, the topic is touched on in several legal and quasi-legal documents. Below is an overview of the policy environment in Iceland in this regards, as well as a short discussion on those implementation bodies that are of the most relevance for innovation facilitation in rural areas of the country and the Northwest region.

4.2.1 Innovation policy

For simplification we can say that the concept of innovation is touched on in at least three different governmental contexts:

1) The policy statement of the current state government[354] from 2003.
2) The legislation on the organization of science and technology policy and the funding of research and technological development, accompanied by a resolution of the science and technology policy council.
3) Parliamentary resolution on a strategic regional development policy and plan for the period 2002-2005.

For the implementation of these different policy contexts, there are furthermore several governmental organizations and institutes that run various innovation-related projects and offer a broad range of programs, services and information to public agents, private firms, and individuals. Some of these initiatives are closely connected to the policy environment, but some are more loosely connected.

In addition to the three cross-sectoral contexts listed above, various industry specific policies exist, which are administered by different ministries. In 1996, the Ministry of Transportation, which is the ministry officially in charge of tourism affairs in Iceland, initiated a policy[355] that describes the state government's vision for the development of the tourism industry until the year 2005. Various working plans have since then followed, targeting different aspects of the

[352] Hagstofa Íslands. 2004c.

[353] Hagfræðistofnun. 2004a.

[354] The Coalition Government of the Independence Party and Progressive Party.

[355] Samgönguráðuneytið. 1996.

industry, including efforts to strengthen recreational types of tourism, e.g. culture-based activities, health-related activities, etc. This emphasis on recreational issues could be regarded as an indication of innovation-oriented strategy. However, the term innovation is not necessarily used in this context.

The Ministry of Agriculture does not currently have in place an overall policy framework for agrifood production. However, the state's emphasis for the development direction of specific branches of the industry is reflected in the state's agreements with farmers within the different branches. An example of such is the Agreement on the operating environment for milk production (see section 4.1.3 for further discussion on the current agreement). The current agreement is valid until the first of September 2005[356]. A successive agreement has already been approved for the period of 2005-2012. The topic of innovation does not receive specific attention in neither the current nor the new agreement.

Finally it should be noted that the private sector also has a role in the context of the innovation policy environment. Several industry associations have included the concept of innovation in policy initiatives that are meant to lead the way of the industry into the future. A good example of this is the official strategy of the Icelandic Travel Industry Association (SAF)[357] for 2004-2012, where innovation receives considerable attention[358]. Also in the official policy of the Icelandic Dairy and Beef Farmers Association (LK)[359], considerable attention is paid to product development and objectives aiming at utilizing milk in innovative ways in the food industry[360]. Although LK's policy reflects a certain indication towards innovation-oriented strategy, the term 'innovation' is not used in this context.

The general policy statement of the current state government (national level)

The policy statement of the state government has a broad mandate, touching on pretty much every sphere of Icelandic society.[361] The statement lists the main emphases of the government in different fields, including the mandate for the key industry sectors of the country. One of the main objectives listed in the policy statement is the following:

> *"Boosting research and development work, among other things to facilitate contributions by businesses for this purpose and thereby stimulate entrepreneurship. In accordance with new legislation on the Science and Technology Council, research activities and innovation will be systematically built up in as many fields as possible."*

The commentary above is the one most directly linked to the general discussion of the concept of innovation within the policy statement. The term 'innovation' only appears in one of the other objectives of the statement. Below is the objective on future emphasis within agriculture:

> *"Creating an operating environment in which Icelandic agriculture can provide consumers with healthy and safe products at favourable prices. Conditions will be established for the sector to exploit its strengths in order to tackle growing competition, among other things in light of the pending WTO agreement. This will be done, for example, by reducing levies on agricultural production, boosting agricultural educational and research establishments and supporting innovation and recruitment in rural areas. These measures will aim to unleash the full potential of the agricultural sector for further growth. Farmers' pension rights and entitlement to sickness benefit also need to be improved.*

[356] Agreement on the Operating Environment for Dairy Production. 1997.

[357] SAF: Samtök ferðaþjónustunnar.

[358] Samtök ferðaþjónustunnar. 2003.

[359] LK: Landsamband kúabænda.

[360] Landsamband Kúabænda. 2003.

[361] Forsætisráðuneytið. 2003a.

As seen from the above, officially the government emphasizes a holistic approach to the facilitation of innovation in a broad range of economic sectors. However, in the actual policy text, the concept is only directly linked to one specific economic sector, i.e. agriculture, through the objective listed above. It should, however, be highlighted that in this particular objective the concept of innovation refers not only to agriculture as a particular economic sector, but also to the wider context of rural economic development.

Policy governance structures in the field of science and technology policy (national level)

Finnbjörnsson (2003) provides an excellent overview of the current Icelandic policy governance structures in the field of science and technology policy. The following text is borrowed from Finnbjörnsson with his permission.

"A new legislation on the organization of science and technology policy and the funding of research and technological development in Iceland was enacted by Parliament (Althing) at the end of January, 2003. The new law took effect immediately.

The legislation is composed of three separate laws:

1) **Law on the Science and Technology Policy Council (nr. 23/2003)** under the Office of the Prime Minister.
2) **Law on Public Support to Scientific Research (nr. 33/2003)** under the Ministry of Education, Science and Culture.
3) **Law on Public Support to Technology Development and Innovation in the Economy (nr. 43/2003)** under the Ministry of Industry and Commerce

The new legislation replaces the earlier law on the Icelandic Research Council from 1994 which is abolished. The main features of the new laws are as follows.

A new Science and Technology Policy Council (SPTC) is established headed by the Prime Minister of Iceland. The Council provides for the permanent seat of three other ministers, the Minister of Education and Science, the Minister of Industry and Commerce and the Minister of Finance. Two other ministers with research in their portfolio can be added to the council at the discretion of the Prime Minister. Fourteen other members are appointed to the Council through nominations as follows:

a) Four nominated by the coordinating committee of higher education institutions (representing 8 higher education establishments)
b) Two nominated by the Icelandic Association of Labour.
c) Two nominated by the Association of Icelandic Industries (Employers).
d) One nominated by the Minister of Education and Science.
e) One nominated by the Minister of Industry.
f) One nominated by the Minister of Fisheries.
g) One nominated by the Minister of Agriculture.
h) One nominated by the Minister of Health and Social Security Affairs.
i) One nominated by the Minister for the Environment.

While not stipulated in the law it is the declared intention that the nominees to the Science and Technology Policy Council shall have scientific, technical and other relevant qualifications and connections to secure the effective implementation of the Councils mission.

Out of the non-ministerial members of the STPC the Minister of Education and Science appoints an unspecified number (probably 9) to the **Science Board** and the minister of Industry appoints an unspecified number (probably an equal number) to the **Technology Board**. It is intended that the membership on the two committees may be mutually overlapping (by two) to secure coordination and continuity between science, technology and innovation in the policy making process.

The mission of the STPC is to strengthen scientific research, scientific training and technology development in the country in support of Icelandic cultural development and increased economic competitiveness. The SPTC shall issue tri-annual guidelines (declarations) for public policies on science and technology. The policy declarations shall be prepared by the Science Board and the Technology Board respectively.

The Law on Support to Scientific Research establishes the **Research Fund** through fusion of the previous Science Fund and the Technology fund of the Icelandic Research Council. The Research Fund is governed by a board, whose chairman is also the chairman of the Science Board. Linked to the same board is also the **Instrument Fund** financed by 20% annual levies on the University Lottery net income. Similarly the Law on the Support to Technology Development and Innovation establishes a new **Technology Development Fund** which is governed be a board chaired by the Chairman of the Technology Board. So far there is no decision on the size of this new fund. Thus the link between policy and implementation through funding is achieved. This law also provides for the establishment of an **Innovation Center**, which is to be linked to **IceTech** (Technological Institute of Iceland).

The chief responsibility for assistance in preparing policy oriented papers is to be provided by the **Ministry of Education, Science and Culture** and the **Ministry of Industry and Commerce** for the two respective boards. Overall co-ordination is provided by a secretary to the Science and Technology Policy Council to be placed within the Ministry of Education and Science. The administrative services to the operational level of the whole structure are provided by the **Icelandic Center for Research – RANNÍS** which is the secretariat of the previous Icelandic Research Council. Its mission is to give administrative and operational support to the boards and funding bodies, to manage the international connections, monitor the effects and impacts of policies and to provide intelligence and informed advice to the STPC and its boards and sub-committees. Thus RANNÍS will administer all the funding bodies set up by the new legislation including the Research Fund, the Technology Development Fund, the Instrument Fund, the **Graduate Training Fund** and other funding bodies for science that the government may want to assign to it. It will maintain the National Contact Point Coordination and support network to the EU Framework program, the Nordic NOS - organizations and other international bodies in science and technology. Thus RANNÍS will function as the operational arm of the new council structure.

The new Icelandic innovation policy governance structures are shown in Figure 4 below:

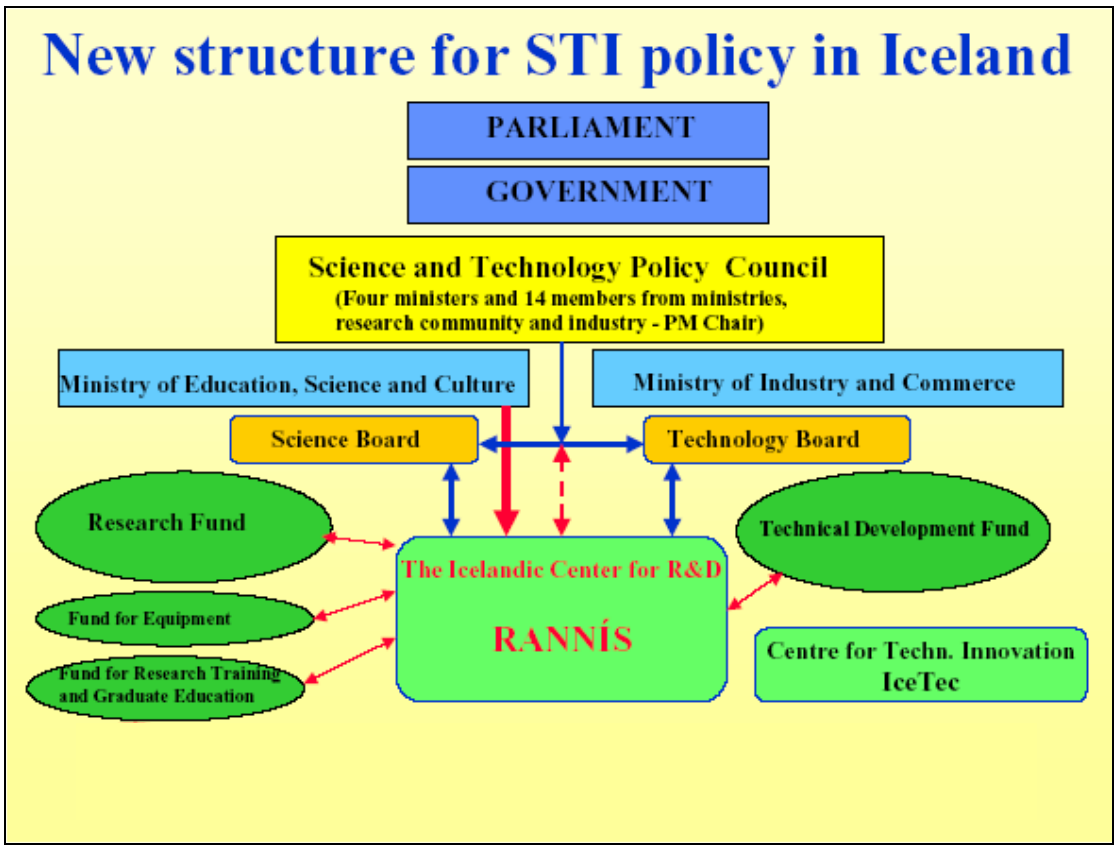


Figure 4: The new Icelandic innovation policy governance structure.

[The quote to Finnbjörnsson's text ends].

One of the first tasks of the new Science and Technology Policy Council has been to put forward a policy resolution. This took place trough a two step process, firstly the release of a Science and Technology Policy in December 2003[362], and then the passing of a resolution of the Council in the summer 2004[363]. In a nutshell both documents are similar in content. The resolution is divided into four chapters, which together identify eight priorities. These are:

1) Strengthening Competitive Funds
2) Strengthening University Research
3) Redefinition of the Structure and Procedures of Public Research Institutions
4) Other Policy Items
    a. International Cooperation
    b. Continuity of Funding for Research and Innovation
    c. Support Network for Innovation
    d. Equality Issues
    e. Increasing the Number of Students in Science and Technology Subjects

[362] Forsætisráðuneytið. 2003b.

[363] Vísinda og tækniráð. 2004.

The content of each priority issue will not be discussed thoroughly in this report. However, as seen from the list above, the resolution is fairly concentrated on research at an advanced level in association with the future development of public research institutes and universities. It is reasonable to argue that the most relevant aspect of the resolution, from the perspective of every day activities of firms in traditional or mature sectors, are sections 4b) and 4c). In these sections the role of various governmental organizations and funding agencies, which provide services to businesses, is discussed. These organizations have a role in supporting innovation activities of firms and should form a bridge between firms and the other agents of the national innovation system that are discussed in the resolution. It should be noted that among those organizations, which are listed in sections 4b and 4c, are various organizations that specifically aim to serve rural areas and the economic sectors most evident in the economic landscape of rural regions (e.g. the Regional Development Agency, the Agricultural Productivity Fund, and the Agricultural Loan Fund). These organizations are, therefore, seen as part of the support network for innovation.

It is also relevant to note that the resolution states that Impra Innovation Centre (a branch of Technological Institute of Iceland) is to be assigned the task of establishing formal cooperation between organizations that provide support for economic development in Iceland, and for linking them to the public support system for scientific research, technological development and innovation. This also applies to the before-mentioned support organizations that have a specific rural focus. Impra Innovation Centre, therefore, has an important role as an intermediary agent within the Icelandic national innovation system. Included in this role is the strengthening and coordination of innovation facilitation in rural regions of Iceland.

4.2.2 Rural development policy (national level)

The Parliament of Iceland has approved a parliamentary resolution on a regional development policy and plan for the period 2002-2005. The parliamentary resolution is based on article no. seven in the Act on the Institute of Regional Development (no. 106/1999), which states that the Minister of Industry and commerce shall submit to the Parliament a proposal for a parliamentary resolution regarding a strategic regional development plan for a period of four years. The Institute of Regional Development in Iceland shall supervise and monitor the implementation of the plan.

The current plan has five overarching goals. These goals are fairly broad and touch on various aspects of rural development. The goals, however, lead into six strategic objectives, which are the following:

1) Growing and diversifying businesses
2) Strengthening communities
3) Enhanced knowledge base
4) Improved transportation
5) Emphasis on sustainable development

These five objectives are then further elaborated on by identifying twelve main so-called strategic themes, which are then finally are developed into 21 specific action proposal/projects.

The term ‘innovation’ appears in several contexts in the regional development policy and the accompanying action proposals. The most evident examples of this are listed below:

1) The first one of the strategic objectives, which is listed in the policy (growing and diversifying businesses) is accompanied by the following text:

   "... A support needs to be given to diversify the business sector by enhancing knowledge and encouraging innovation in traditional and new sectors and hence increase the number of specialised jobs ..."

   Here the importance of innovation is stressed, as well as the need for applying the concept in a broad context and to old and new economic sectors.

2) The second of the main strategic themes highlights the importance of competent local development work in all regions. This theme is accompanied by the following text.

   "Government support programmes for enterprises, based on both regional and economic strategies, are multifaceted and strongly tied to different sectors, i.e. agriculture, fisheries, manufacturing and tourism, and long-established contentious division of roles between ministries has impeded government endeavours to support new business initiatives and ventures. ... It is essential to restructure local economic development assistance and advisory services in the peripheral regions, with the objective of making it more fruitful, i.e. to increase value for money and create more new businesses."

   Here the need for coordination of activities that are meant to facilitate innovation is stressed.

3) In association with strategic theme number eight, which stresses the important role of culture, the following statement is put forward:

   "...It is also crucial that culturally based tourism will be considered as an important sector when it comes to government support for innovation and economic development."

   Here culturally based tourism is identified as a specific economic activity that holds innovation potential.

4) Finally three of the 21 action proposals (no. one, two, and fourteen) are specifically relevant in the context of innovation and innovation facilitation. Proposal no. one suggests that a specific innovation center shall be establish in the town of Akureyri in North Iceland with the assigned task to coordinate public support for innovation activities in rural regions of the country.[364] Proposal no. two discusses the need to better coordinate the work of the different public funding agencies, which allocate funds to different innovation-related projects. Finally proposal no. fourteen suggests a specific development programme for selected municipalities where, amongst other things, the aim is to strengthen innovation and the economic wellbeing of the residents of those municipalities through the establishment of various new ICT-related projects.

As seen by the list above, innovation receives considerable attention in the regional development policy of the Icelandic state government, both in the context of overarching goals and strategic themes as well as in direct action proposals.

As stated earlier, the governmental organization in charge of the rural policy process is the Institute of Regional Development. The institute, in partnership with various other agents, is also the main implementation body for the associated plan and action proposals. The Institute

[364] It should be noted that this center has already been established (Impra innovation centre). The results of the center's coordination efforts, however, remain to be evaluated.

of Regional Development, therefore, is assigned an official role as an innovation facilitator in the rural regions of the country. Various other organizations also have an important role as innovation facilitators in rural Iceland, although they are in most cases only indirectly linked to the implementation of the rural development policy. Organizations that have a key role in this context will be listed in section 4.2.5 of this report.

4.2.3 Linkages between innovation policy and development policy

Since there is not a single direct governmental policy framework targeting innovation in Iceland, the linkages between innovation policy and development policy in Iceland are not clear-cut. However, as noted in the previous section, the term 'innovation' appears in several aspects of the regional (rural) development policy and the accompanying action proposals. There are no direct linkages between the before-mentioned policy governance structures for science and technology and the regional (rural) development policy. However, it seems reasonable to argue that the most relevant aspect of the science and technology policy framework, for innovation facilitation in rural areas, are the sections on the role of various governmental organizations and funding agencies, which provide services to businesses. Among those organizations, mentioned, as agents that have a role in the overall official support network for innovation, is the Regional Development Agency. Since the Regional Development Agency is also the key implementation body for the rural development policy the agency could be regarded as an unofficial linkage point between the two policy frameworks.

4.2.4 Policies at the regional and local level

Currently there is no mandatory legal requirement for municipalities or regions of Iceland to form a specific policy or a plan for economic and/or social development. It should be noted that the Icelandic governmental structure has only two official levels, the state level and the municipal level. The term 'region' in Iceland, therefore, does not represent an official governmental level, with associated governmental structures, income and expenditure basis, or responsibilities. In spite of that, the country is commonly divided into regions, representing different geographical areas. Statistics Iceland for instance uses a division that initially was similar to the geographical division for the constituencies, used for deciding the composition of the state parliament's member group. The structure of the constituencies has now been redefined, but the old constituency structure still forms the basis for a regional division used for a number of different purposes, e.g. the operational areas of regional offices of governmental institutes. Also regional associations of municipalities commonly are built on the old constituency structure. The definition of the Northwest region of Iceland, which has been chosen as a study area for the ISP study, is an example of a definition, which is built on the above premises, i.e. the old constituency structure.

Partly due to the circumstances described above, planning for economic and social issues currently barely exists at a regional level in Iceland and these affairs also appear to be on a very underdeveloped stage at the local/municipal level, at least in the rural regions of Iceland. It is also important to note that the municipal structure in many of Iceland's rural regions is characterized by extremely small municipalities, in regard to population numbers[365] and hence

[365] In some cases the population number is less than 250.

also in regard to the scope and scale of economic activities. Due to this situation, many of the smaller municipalities do not realistically possess the preconditions or the capacity for sophisticated strategic economic planning.

The Northwest region possesses five municipalities with a population number exceeding 500. Of these, two have a currently valid formal policy, or a strategic vision, for economic development in place. These are Blönduósbær municipality and Húnaþing vestra municipality. Both these municipalities are located in East and West Húnavatnsýsla district.

Blönduósbær's policy on economic development[366] was passed in 2003, and spans the period 2003- 2013. In this policy a three-fold vision is put forward, which should lead development initiatives in the given period:

1) Blönduósbær shall become known as a leading "food production town", in regard to entrepreneurship and research within the food production sector in Iceland.
2) Blönduósbær shall become a renowned tourism destination, regarded as a fun place to visit for families and other tourists.
3) Blönduósbær municipality will create a facilitating and supporting environment for food production firms.

Blönduósbær's policy vision is fairly clear-cut, with an obvious emphasis on two industry sectors, i.e. food production and tourism. Based on the three-fold vision, 10 key-goals are identified, accompanied by measurable indicators, and implementation strategies. The policy quite clearly focuses on facilitating entrepreneurship, innovation and growth within the two sectors. This is especially evident in relation to goals and strategies targeting the food production industry.

The current policy of Húnaþing vestra municipality[367] is quite different from the one of Blönduósbær municipality. The policy is built on a holistic approach where economic development is seen in as closely connected to the overall development of the community. The policy defines 18 topics that need to be addressed (policy targets). Some are directly economic development related but others are focusing on community development issues in general. Examples of such topics are infrastructure related matters, such as the development of transportation networks and telecommunication systems, as well as discussion on the development of education systems within the municipality and development of a land use plan. The policy does not clearly identify specific industry sectors that should be focused on, although tourism development and marketing of the area evidently receive considerable attention. The policy itself does not identify specific development strategies or implementation projects. However, following the policy process the municipal government put forward an implementation plan. This plan lists how each topic should be addressed, and who should be involved in the implementation. The plan, however, does not identify a specific time frame or indicators of success. The policy and associated implementation plan, focuses on various aspects of the community that need to be developed, some of the projects proposed include implementation of novelties and establishment of new initiatives and/or organizations. The policy, therefore, has some orientation towards innovation, although this orientation is not very

[366] Blönduósbær. 2003.

[367] Hagfræðistofnun. 2004b.

clear-cut and the specific term 'innovation' is not commonly used in the actual policy documents.

In addition to the policy efforts of the two municipalities discussed above, Skagafjörður municipality is presently initiating a policy process for economic development, which is to be completed before the first of December 2005. Skagafjörður municipality is also initiating a specific policy processes targeting tourism development within the municipality. This is also to be completed in the year 2005.

It should be noted that in the year 2001, the Association of municipalities in the Northwest region[368] put together a joint vision for future economic development of the region. This initiative was carried out for the purpose of being a joint input of the municipalities of the region to the state's rural policy process (see section 4.2.2 on the current national rural policy). This joint vision has, however, not been actively implemented by the association nor its member municipalities.

4.2.5 The official framework for business services and innovation facilitation in rural Iceland

Measures for innovation facilitation at the regional and local level in rural Iceland, given the specific industry focus of the ISP project, can be described from a three-fold perspective:

1. **Regional economic development corporations[369]:** Eight official economic development corporations are operated in the regions, outside the capital region, of Iceland. These corporations service firms, organizations and individuals in different geographical areas. They are usually run as a joint initiative of the state and the municipalities within each area. However, business associations, trade unions, and other regional organizations, in some instances also take part in running the corporations. The state provides a proportion of their operational funding, which is channelled through the Development Department of the Institute of Regional Development, which also has an advisory and a monitoring role for the corporations. In some instances the corporations are directly linked to formal associations of municipalities and act as their offices as well. The corporations' role varies a bit between different corporations, but most have a primary focus on facilitating economic development and innovation through specific projects or services to firms, entrepreneurs, organizations and community groups. Usually the corporations have a wide cross-sectoral focus. In some instances the corporations employ or host a specific staff person focusing on tourism development, commonly referred to as a 'tourism development officer'[370]. These officers are however, in some instances associated with other organizations (see next paragraph). One of the eight economic development corporations, in rural Iceland, is the Economic development corporation of the Northwest Region, which, as indicated by its name, services the geographical area that was chosen as a study region for the ISP project.

[368] In Icelandic: Samtök sveitarfélaga á Norðurlandi vestra.

[369] In Icelandic: Atvinnuþróunarfélög.

[370] In Icelandic: Ferðamálafulltrúi.

2. **Local economic and/or tourism development officers[371]:** Some municipalities in rural Iceland have a specific staff person focusing on economic development and/or tourism development. These staff persons also commonly have a role in promotion and public relation activities of the municipal office in question. Most commonly the local officers are hosted at the municipal office or at a local tourist information center. These officers, in most cases, are responsible for facilitating economic and/or tourism development within the municipality as well as for providing assistance to firms, community groups and individual in the field of economic and/or tourism development. In many cases the local officers work closely with the regional economic development corporation in the surrounding region. Skagafjörður municipality is the only municipality within the Northwest region that has a specific position for a economic development officer. This position also includes the responsibility for tourism development in addition to various other activities.
3. **Regional agricultural extension services[372]:** Specific agricultural extension services are operated in all rural areas of Iceland. These build on a long-standing tradition. The services are in most instances run by the regional farmers associations. The majority of the operational funding of the services is provided by the state, partly through specific taxation on farmers. The funding is channelled through the regional farming associations. The extension services staff provide professional consultation to farmers, on pretty much every aspect of farming; from advice on animal feeding to managerial and accounting guidance. Two agricultural extension services are operated in the Northwest region. One services the East and West Húnavatnssýsla district[373], and the other services Skagafjörður district.

In addition to the above, various organizations, associations, and institutes offer innovation-related services on a cross-sectoral basis. Many of these operate on a national level and commonly do not run regional branches or offices. Examples of these are the Technological Institute of Iceland (IceTec) and Impra innovation center (a specific branch of IceTec), the Institute of Regional Development, various public and private financial institutes, etc. It should be noted that the Institute of Regional Development is located in the town of Sauðárkrókur (Skagafjörður municipality) in the Northwest region.

Specific support structure and services for agrifood production

Historically Icelandic agrifood production has a strong status in Icelandic society. Traditionally the industry enjoys extensive goodwill within the governmental system in regard to resources allocated to the industry. This applies to different aspects of the industry, reaching from the direct support payments to farmers (subsidies), education and research related to the industry as well as to different support services and consultation mechanisms available to the industry[374]. The overall industry system, including education, research, funding agencies, industry associations and support services has developed quite

[371] In Icelandic: Atvinnu- og ferðamálafulltrúar.

[372] In Icelandic: Ráðunautaþjónustur.

[373] This agricultural extension service also services a part of a neighbouring region, i.e. Strandasýsla County.

[374] Note: The different support services and consultation mechanisms are partly funded with special taxation on farmers.

independently from other spheres of Icelandic economic life. The industry, therefore, has access to industry specific institutes relating to pretty much every aspect of its existence.

The table below lists various players that have a role in the industry system of Icelandic agrifood production, with an emphasis on those directly linked to dairy production[375]. Many of these operate at a national level, while others have a regional/local focus. However, firms and individuals involved in milk production and the dairy industry in the Northwest region have access to all of those listed below, in one way or another.

Organization/Institute/Board/Association	Contact information
The Ministry of Agriculture (Landbúnaðarráðuneytið)	http://www.landbunadarraduneyti.is/
The Farmers Association of Iceland (Bændasamtök Íslands)	http://www.bondi.is
The Industry Board for Cattle Farming (Fagráð í nautgriparækt)	http://www.bondi.is/landbunadur/wgbi.nsf/key2/hbsr53jk9a.html
Regional Farmers Associations (Búnaðarsambönd)	http://www.bondi.is/landbunadur/wgbi.nsf/key2/bunadarsambond
Regional Farming Extension Services (ráðanautaþjónustur)	http://www.bondi.is/landbunadur/wgbi.nsf/key2/bunadarsambond
The Icelandic Association of Cattle Farmers (Landssamband kúabænda)	http://www.naut.is
Regional Cattle Farming Associations (Nautgriparæktarfélög)	http://www.naut.is/default.asp?sid_id =119&tre_rod=002|003|&tId=1
The Agricultural College Hvanneyri (Landbúnaðarháskólinn á Hvanneyri) *	http://www.hvanneyri.is/
The Icelandic Agricultural Research Institute (Rannsóknastofnun landbúnaðarins) *	http://www.rala.is/
The Institute for Experimental Pathology of the University of Iceland (Tilraunastöð Háskóla Íslands í meinafræði að Keldum)	http://www.keldur.hi.is/
The Agency for Agricultural Statistics (Hagþjónusta landbúnaðarins)	http://www.hag.is/
The Agricultural Loan Fund (Lánasjóður landbúnaðarins)	http://www.llb.is
The Agricultural Productivity Fund (Framleiðnisjóður landbúnaðarins)	http://www.fl.is
The Association of Dairy Plants (Samtök afurðastöðva í mjólkuriðnaði: SAF)	http://www.saf.is
The Icelandic Dairy Produce Marketing Association (Osta og smjörsalan)	http://www.ostur.is/enska/index.htm
The Dairy Laboratory of Iceland (Rannsóknastofa mjólkuriðnaðarins)	http://www.sam.is/frodleikur/rannsokn_mjolkur.htm
** As of January 01 2005, the Agricultural College at Hvanneyri and the Icelandic Agricultural Research Institute, as well as the Icelandic Horticultural College, will be merged in one institute.*	

Table 4: Various players that have a role in the industry system of Icelandic agrifood production, with an emphasis on those directly linked to dairy and beef production. (Note: Not an exhaustive list).

Specific support structures and services for tourism

The organizational landscape of the tourism industry in Iceland, in regard to research, education, and consultation services, is quite complex, with a mixture of players operating at the local, regional and national level. Below is a list of the most important players that have a role in developing the industry, with an emphasis on those linked to tourism development in

[375] Icelandic names of organizations/associations/institutes in parentheses.

the rural areas of the country[376]. Firms and individuals involved in the tourism industry in the Northwest region have access to all of those listed below, in one way or another.

Organization/Institute/Board/Association	Contact information
Icelandic Ministry of Communications (Samgönguráðuneytið)	http://www.samgonguraduneyti.is/
The Iceland Tourist Board (Ferðamálaráð Íslands)	http://www.ferdamalarad.is http://www.icelandtouristboard.com/
Icelandic Travel Industry Association (Samtök ferðaþjónustunnar: SAF)	http://www.saf.is
The Icelandic Tourism Association (Ferðamálasamtök Íslands)	petur@icetourist.is
Regional Tourism Associations (Ferðamálasamtök landshlutanna)	---
Local Tourism Associations (Ferðamálafélög á afmörkuðum svæðum eða sveitarfélögum)	---
Municipalities (Sveitarfélög)	http://www.samband.is/ template1.asp?id=364
The Association of Tourism Officers (Félag ferðamálafulltrúa)	http://www.tourofficers.is/
Economic development corporations (Atvinnuþróunarfélög)	http://www.byggdastofnun.is/Sam starfsadilar/Atvinnuthrounarfelog/
Tourist information centers (Upplýsingamiðstöðvar)	http://um.margmidlun.is/um/ ferdamalarad/vefsidur.nsf/index/23
Association of farm tourism operators (Samtök ferðaþjónustubænda)	http://www.farmholidays.is/
The Institute for Regional Development (Byggðastofnun)	http://www.byggdastofnun.is
The Agricultural Productivity fund (Framleiðnisjóður landbúnaðarins)	http://www.fl.is
The Marketing bureau of North Iceland (MBNI) (Markaðsskrifstofa Ferðamála á Norðurlandi)	http://www.northiceland.is
The Iceland Tourism Research Centre (Ferðamálasetur Íslands)	http://www.fmsi.is
Hólar University College, Rural Tourism Department (Háskólinn á Hólum, Ferðamáladeild).	http://www.holar.is/english/tour.htm
University of Akureyri, Faculty of Management, Department of Tourism (Háskólinn á Akureyri, Viðskiptadeild, Ferðaþjónustubraut)	http://www.unak.is/template 1.asp?PageID=1086
University of Iceland, Faculty of Science, Department of Geosciences, Tourism Studies (Háskóli Íslands, Raunvísindadeild, Jarð- og landfræðiskor, Ferðamálafræði)	http://www.hi.is/nam/jardland/ indexE.htm
Tourism studies at Menntaskólinn í Kópavogi	http://www.mk.is

Table 5: Various players that have a role in the industry system of Icelandic tourism, with an emphasis on those having a role in the rural context. (Note: Not an exhaustive list).

[376] Icelandic names of organizations/associations/institutes in parentheses.

4.2.6 The official framework for rural business services and innovation facilitation in the Northwest region

The official framework for business services and innovation facilitation in the Northwest region is structured in a similar way as has been described as the general norm for rural regions of Iceland in a previous section of the report (see section 4.2.5). The table below lists some public organizations that can be regarded as key players in this context within the Northwest region[377].

Support service providers	
Organization	*Contact information*
The Association of Municipalities in the Northwest region and the Economic Development Corporation of the Northwest Region (Samtök sveitarfélaga á Norðurland vestra (SSNV) and Atvinnuþróunarfélag Norðurlands vestra (ANVEST)): The association runs the regional economic development corporation. In Dec. 2004, the corporation employed three development officers. One is located in Húnaþing vestra municipality, one in Blönduósbær municipality, and one in Skagafjörður municipality. The officers are involved in various tasks that have to do with economic development (including tourism development) and provide advice to firms, community groups and individuals.	http://www.ssnv.is http://www.anv.is
Center for young entrepreneurs in Húnaþing vestra municipality (Frumkvöðlasetur ungs fólks í Húnaþingi vestra): *The center is actually in the form of a support programme for young entrepreneurs. The programme is hosted by a local development association (Hagfélagið) but supported by the municipality, the local bank, ANVEST and others. The programme provides a small grant to young entrepreneurs that wish to develop new projects within the municipality. The programme also provides an access to a professional consultant (the local economic development officer) and some educational courses.*	http://www.anv.is gudrun@anv.is
Skagafjörður municipality/economic development officer (Sveitarfélagið Skagafjörður, deildarstjóri markaðs- og þróunarsviðs): Skagfjörður municipal office includes a position for a local economic development officer. This staff person is also in charge of promotional and PR related efforts and various other tasks.	http://www.skagafjordur.is/displayer.asp?cat_id=58
The Regional Farmers Association of Skagafjörður District and the Agricultural Extension Service for Skagafjörður district (Búnaðarsamband Skagfirðinga and Leiðbeiningaþjónustan ehf.): The extension service is run as an independent organization, with the key partners being the Regional Association of Farmers and the local cooperative (KS). The extension service's staff provide professional consultation to farmers on pretty much every aspect of farming; from advice on animal feeding to managerial and accounting guidance. The extension service occasionally organizes educational seminars for farmers as well as acts as a linkage point between farmers in Skagafjörður district and various national agricultural institutes and organizations.	http://www.bondi.is/landbunadur/wgbi.nsf/key2/bunskagfirdinga
The Regional Association of Farmers in East Húnavatnssýsla and the Agricultural Extension Service for Húnvatnssýslur and Strandir district (Búnaðarsamband Austur Húnavatnssýslu and Ráðunautaþjónusta Húnaþings og Stranda) The extension service is run by the Regional Association of Farmers in East Húnavatnsssýsla as well as two other regional farmers associations. The extension service's staff provide professional consultation to farmers on pretty much every aspect of farming; from advice on animal feeding to managerial and accounting guidance. The extension service occasionally organizes educational seminars for farmers as well as acts as a linkage point between farmers in Skagafjörður district and various national agricultural institutes and organizations.	http://www.bondi.is/landbunadur/wgbi.nsf/key2/radunautathjonusta_hunathingsogstranda

[377] Icelandic names of organizations in parentheses.

The Tourism Association of the Northwest region, plus a number of differently active local associations (Ferðamálasammtök Norðurlands and Ferðamálafélög á Norðurlandi vestra). The Tourism association is a grass-root organization of firms, municipalities and individuals that are involved or interested in tourism within the Northwest region. The Association and its local groups take part in running tourist information centers throughout the region. It is also a member in a national umbrella organization (the Icelandic Tourism Association).	johannaogalli@mmedia.is
Tourism marketing organizations	
Organization	*Contact information*
The Marketing Bureau of North Iceland (MBNI) (Markaðsskrifstofa Ferðamála á Norðurlandi). The Bureau is a recently established organization owned by the Tourism Association of the Northwest region (see above) and the Tourism Association of the Northeast region. It is funded by municipalities in North Iceland* as well as individual tourist firms through a membership fee, and through development grants provided by the state (or its institutes). The mandate of the Bureau is to facilitate increased cooperation between tourism firms in the area, as well as facilitating cooperation between different municipalities in the field of tourism development, especially in regard to marketing and promotion of the area. ** Note: Not all municipalities in the area have chosen to support the Bureau.*	http://www.northiceland.is
The Tourist Information Center in Varmahlíð (Upplýsingamiðstöðin Varmahlíð) The Tourist Information Center is open year around and is funded by the Iceland Tourist Board, The Tourism Association of Northwest Iceland, Skagafjörður Municipality and others. The Center has an official role as a service center for the Northwest region as a whole, but in addition several other tourist information centers are run throughout the region.	http://www.northwest.is
Other	
Organization	*Contact information*
Some educational institutes have an indirect role in innovation facilitation in the region. The following two are examples of such institutes. ➢ **Hólar University College** (Hólaskóli) ➢ **Center for continuing education of the Northwest region** (Farskóli Norðurlands vestra)	http://www.holar.is http://www.fsnv.is.

Table 6: Local and regional public organization and associations that have a role in business services and innovation facilitation in the Northwest region.

In addition to local and regional public organizations and associations, firms, community groups and individuals in the Northwest region have access to the services of the various organizations, institutes and association that have been listed in Table and Table .

Examples of recent and ongoing development initiatives in the Northwest region

Table lists examples of specific development initiatives and projects that are currently ongoing or have recently taken place in the Northwest region. The table lists projects that are lead by public development groups, support agents, or carried out as joint initiatives of the public and private sector. The emphasis is, furthermore, on initiatives/projects that have to do with the two industry sectors that were focused on in the ISP project. The focus is, therefore, on projects/initiatives that are meant to strengthen the regional infrastructure or the conditions for further growth within the two industry sectors, rather than on various projects, which are being carried out by private firms or individuals.

Name of project/initiative	Agent responsible	Short description
TOURISM		
Grettistak	Initiated as a cooperative effort of Húnaþing vestra municipality, a local tourism association and a local folk museum.	Grettistak is an organization, established in 2002 in Húnaþing vestra municipality in West Húnavatnssýsla district. The mandate is to facilitate cultural and economic growth in Húnaþing municipality by utilizing cultural heritage and history of the area, especially the Icelandic sagas. The supporting objectives are to make Húnaþing vestra more visible as a tourism destination, as well as building a joint platform, which private firms and individuals in the area can utilize in their development efforts. For further information see www.grettistak.is, and http://www.northernperiphery.net/main-projects.asp?intent=details&theid=44
The Seal Center in Hvammstangi	The Economic Development Corporation of the Northwest region, in association with various other agents, e.g. the Húnaþing vestra municipality, the Icelandic Institute of Natural History, etc.	This project has recently been launched. The goal is to establish a center where exhibits will be held focusing on the natural seal habitat in the surrounded area. The center will also have the role of general tourist information office. For further information see http://www.anv.is and http://www.northwest.is.
Northern Costal Experience (NORCE)	This is a transnational project with 15 participants from seven countries. The project is lead by the Economic Development Corporation of the Northwest region.	The project focuses on heritage-based tourism. It can be regarded as an initiative aiming at improving the conditions for innovation, through the exchange of experiences and ideas between the project partners and the facilitation of local networks, and the development of new products and marketing strategies at the local level. The project receives its core funding from the Northern Periphery Programme (NPP). http://www.northernperiphery.net/main-projects.asp?intent=details&theid=66
The Triangle Hiking Trails	The Economic Development Corporation of the Northwest region, in association with the local tourism associations and the municipalities in the targeted area.	This project focuses on establishing marked hiking trails on Skagi and the neighbouring areas, and by doing so creating a net of trails between the urban centers Blönduós, Skagaströnd, and Sauðárkrókur in the Northwest region. Contact information: http://www.anv.is
Project on Vatnsdæla Saga	The Economic Development Corporation of the Northwest region, in association with various interest groups, organizations and stakeholders in the targeted area as well as a number of organizations outside the region.	This is a project that is still early in its development process. The project targets Vatnsdalur and the neighbouring area in the East Húnavatnssýsla District in the Northwest region. The mandate is to enhance utilization of the cultural background and the Sagas of the area for the development of tourism products. Contact information: http://www.anv.is
Service Center in Blönduós	Blönduósbær municipality in cooperation with a private firm operating a camping and a cabin site.	This project is still in the planning process. The project includes building a new service center for tourists in Blönduós. The center will be a service center for a camping and a cabin site, information center and meeting facility.
The Food Chest Skagafjörður	Hólar University College Rural Tourism Department, in association with food producers, food processors, and restaurant owners, the municipality of Skagafjörður and others.	This project focuses on culinary tourism. The project is seen as a multi-year endeavour with the principal objective of developing culinary tourism in rural areas in Iceland. In the first project phase, an emphasis is put on Skagafjörður District. The project will aim at identifying what role food plays in the tourism industry and explore ways to increase the economic impact of local foods to both domestic and international tourists. Further information: http://www.holar.is/matur/ensk.htm
Research on Skagafjörður as a Tourist Destination	Hólar University College Rural Tourism Department.	This is an on-going applied research project, which aims at analyzing the status of Skagafjörður district as a tourist destination as well as identifying the key components of the area's attraction for tourists. The competitiveness of Skagafjörður district as a destination will also be evaluated. Information is gathered among tourists as well as among tourism experts within and outside the area. The project results will be utilized in further development

		of the tourism industry within the targeted area. Further information: http://www.holar.is/english/
Sturlungaslóð (Historical sites of Sturlunga Saga)	The Folk Museum of Skagafjörður (Skagafjörður municipality), and others.	This is a project still early in its development process. The project targets historic sites in Skagafjörður district, which are associated with the Sturlunga Saga. The mandate is to develop and publish brochures and maps for the purpose of promoting the sites to tourists. Contact information: http://www.skagafjordur.is
Hólar archeological research project	The National Museum of Iceland, the Folk Museum of Skagafjörður (Skagafjörður municipality), Hólar University College, and others	In relation to a large scale archeological project in Hólar Skagafjörður District, specific tours as well as other activities that have to do with distributing information on the history of Hólar have been organized. These activities have especially been targeting tourists where the mandate is to utilize the historical and cultural background of the area for tourism development. Further information: http://holar.is/%7Efornleifar/
MILK PRODUCTION AND THE DAIRY INDUSTRY		
Matgæði	Blönduósbær municipality in association with two food research firms in Reykjavík and food processing firms in Blönduósbær municipality	Following Blönduósbær municipality's economic development policy process in 2003, the municipality in cooperation with two food research firms in Reykjavík and food processing firms in Blönduósbær municipality, have established an organization, specializing in consultation on food research, product development and quality management in food production. The organization also has the mandate to seek for new partners and marketing opportunities in Iceland and abroad for food products produced by firms within the municipality. This organization is meant to strengthen the role of Blönduósbær municipality as a food production town.

Table 7: Examples of recent and ongoing development initiatives in the Northwest region, within the two chosen industry sectors. (Note: Not an exhaustive list).

Although the table above does not include an exhaustive list of the development projects and activities that are going on in the Northwest region, it is quite evident that tourism is receiving considerable attention by the public development organizations in the area. Food production, however, seems to be receiving very limited attention by public agents.

It should be stressed that additional projects and programmes are offered by various organizations and institutes. Many of these are administered by organizations that operate at the national level (e.g. by Impra Innovation Center, the Institute for Regional Development, the Icelandic Agricultural Research Institute, etc.). These projects do, therefore, not put their sole focus on the Northwest region, although they might include, or target, firms, individuals or agents within the region. It should also be noted that several projects are run by Hólar University College in Skagafjörður district, which focus on different aspects of rural tourism development in Iceland. Some of these projects have a national focus and do, therefore, also include some initiatives within the Northwest region.

4.3 Findings from the agrifood industry (milk production and the dairy industry)

This chapter contains the key findings from the empirical data gathering of the case study of milk production and the dairy industry in the Northwest region.

4.3.1 Background information

Sixteen interviews were carried out with people involved in milk production and the diary industry in the study region. Tabel 8 list the categories of interviewees as well as the number of interviewees within each category.

OVERVIEW OF INTERVIEWEES ***Case study of the milk production and the dairy industry in the Northwest region***	**Focus (market/operational area)**	**No. of interviews**
Primary production: Dairy farmers (all run as family farms, in all cases a couple was interviewed)	Local/regional	7
Processing: Representatives of dairy plants (processors) within the region	Local/regional/national	2
Representatives of associated dairy operation (parenting firm)	National	1
Supporting agents: Representatives of economic development corporations	Local/regional	1
Representatives of farming extension service providers	Local/regional	2
Representatives of industry associations	Local/regional	1
Representatives of educational and research institutes	National	2
	Total:	16

Table 8: Categories of informants and number of informants interviewed in association with the case study of the milk production and the dairy industry in the Northwest region.

As seen in the table above, the interviewees included representatives of farm operations and processing firms (dairy plants) as well as representatives of various support agents that are associated with or provide services to the industry both at the regional and national level. The annual turnover of the farms visited was between 11 and 25 millions ISK[378], the employment created on the farms was between two and three man-year per farm and the farming experience of the farmers ranged between eight and 33 years. The total annual turnover of the two dairy plants in the region is close to 1.200 millions ISK[379]. The plants create employment of around 20 man-years annually. Both of the dairy plants visited are mature firms, established before the middle of last century.

4.3.2 Knowledge and competence base

Since the study included both representatives of the primary production (i.e. farming operations) as well as the processing (i.e. dairy plants), the nature of the firms' knowledge and competence base turned out to be quite varied. It is, therefore, reasonable to discuss the knowledge and competence base, at the firm level, based on the two different groups of firms:

[378] Exchange rate: ISK / 87 = Euros.
[379] Exchange rate: ISK / 87 = Euros.

Farming operations: The educational level of the farmers was very diverse. In majority of the farms, however, at least one of those responsible for the farm had a diploma in agricultural studies. There were also examples of farmers with a university degree from agricultural programmes. Generally the younger farmers possessed better education. In majority of cases the farmers expressed that to be successful at their job they really needed a very broad range of competences, i.e. to be ”masters of every trade”.

With only one exception, the farm representatives had participated in at least one short-term training course in the past 24 months. In all cases these courses were associated with the every day activities at the farm, rather than associated with implementation of novelties of some sort. The most common courses had to do with accounting and computer training. In all cases training had been accessed locally or regionally and provided/organized by local or regional service providers. The farmers generally expressed positive attitudes towards the possibility of participating in further education or training, although few had any direct plans of that sort. Those representatives of different support organizations that are associated with the farming industry (including educational and extension services providers) also generally expressed that in their experience farmers were generally keen on acquiring new knowledge and skill and participating in initiatives in this regard. One of the representatives of the supporting agents also mentioned that many farmers he was acquainted with used the Internet to a great extent to access new information and knowledge.

The farmers generally expressed that the need for good management and computer skills as well as technology know-how were constantly on the rise. In relation to possible future implementations of novelties, majority of the farmers mentioned that the complicated nature of new equipment (for example milking robots or other digital equipment) likely would call for an increased technological know-how. The representatives of the supporting agents generally agreed that due to the diverse nature of farmers' background and overall competences, it was hard to put a finger on the primary needs for new knowledge. A common viewpoint of the support agents, however, was that the overall basic knowledge of farmers could do with some improvement. Here managerial and computer skills were mentioned. Also an important point was raised by one of the supporting agents about the need for improving language skills of farmers for the purpose of improving their opportunities to access new knowledge from abroad (through the internet, journals, etc.). This was especially important in the context of following newest trends in the development of equipment and techniques.

The farmers generally perceive new knowledge and information as accessible. More commonly the interviewees look for sources of information and new knowledge within the region, particularly at the local/regional farming extension service offices. Majority of the farmers interviewed expressed that communication with other farmers as a very important way for getting introduced to novelties. A local or regional focus seemed to be more common in this regard, although visits to farms in other regions of the country were also mentioned as important.

Dairy plants: The employees of the two dairy plants visited, can be divided into two groups. Firstly specifically trained dairy technicians (a specific type of trade) or food production specialists, which accounted for close to half of the employees including the executive managers in both cases. The other half of the employees consisted of general workers who take care of various tasks (mostly not very knowledge intensive). The most evident part of the

official knowledge base, therefore, was in the form of the dairy technicians' expertise. The representatives of both firms expressed that this expertise was the basis for product development within the firm. It should be noted that no training programmes for dairy technicians exist in Iceland. The employees at the operations visited, therefore, had accessed their training abroad (Norway and Denmark).

Participation by the dairy technicians in continuing training or education (post-school training and education) were fairly infrequent, although representatives of both firms expressed that personnel occasionally took part in training courses (on a few years interval). Such courses commonly had to be pursued abroad, although there had been instances were the Icelandic association of dairy technicians had offered courses. Communication or cooperation with domestic educational institutes seemed to be very infrequent if any. In regard to the development of the firms' knowledge and competence base, both representatives highlighted the importance of staying in contact with colleagues (old school mates) from abroad. Also there were examples of apprentices (Icelandic and foreign) staying at the firm for a period of time, in some cases bringing new knowledge with them. The informants' view of what, if any, knowledge and competences were the most lacking to ensure success of new innovation projects, varied. However, there were some direct views expressed that there might be a need for better competences in the field of strategic management and project management that could contribute to better success in this context.

Similar as with the farmers the representatives of the dairy plants expressed that they regard new knowledge and information generally to be accessible. In spite of the fact that new knowledge most often has to be looked for abroad, the representatives expressed that there were accessible channels in place for this purpose and this could not be regarded as a hindering factor for future innovation projects.

4.3.3 Innovation activity

Innovations can easily be found both at the primary production phase (i.e. at farms) and at the processing phase.

Process innovations that aim at increasing efficiency, reducing costs, as well as improving working conditions seem to be the name of the game concerning innovation in farming. The farm innovations are mostly incremental, can concern pretty much every aspect of the operation, and in many cases appear as series of implementations of new methods or technologies, which sometimes extend over a few years period. Examples of incremental innovation projects at farms are installations of digital feeding systems and the launching of considerable barley cultivation, replacing a total reliance on imported grain. Innovation projects of considerable scale were also found among the farm operations visited. An example of this is the installation of a computerized milking robot at one of the farms visited in Skagafjörður district. The goal of the larger projects is often multifold/complex (increased turnover, improving efficiency, labour reduction, etc.) while the smaller projects most often focus solely on reducing labour or changing working conditions.

The majority of the innovation projects found at farms in this study can be regarded as "in-house innovations", i.e. the projects first and foremost include implementations of something new to each operation. However, novelties at the local and regional level were also found and in the case of one farm innovations that encompassed something new in the national context

were evident. This farm's projects were carried out in close cooperation with the Icelandic Agricultural Research Institute and the Agricultural College.

Innovation in farming seems to be to large extent influenced by age of the farmer. One of the farmers commented on this, in a way that gives a clear indication of the situation:

> *"We do really have three groups of farmers, pretty much equal in size. The first group consists of farmers that are fairly young, generally wish to expand the operation and increase their production rights, and improve their working conditions and other aspects of the operation. Secondly we have the middle age farmers. Some are still active in developing their operation, while majority of them just wishes to make the most of previous improvements and investments. The latter group does generally not aim at sustaining the competitiveness level of their operation and in that way make it attractive for a future buyer. This group plans to sell their production rights and stay at the farm in their old age. The third group consists of farmers that have already 'burned up' their investment/farm and are basically in the position of waiting for the right opportunity to sell their production rights, quit farming, and either stay or leave the farm depending on personal circumstances."*

The farm, as a business operation, seems also to be very much influenced by the fact that it is most often run as a family business and the farm activities are very much influenced and interconnected to the general every day life of the farm family. The development of the operation (innovation projects being no exception) is influenced by this situation. To make the operation more family-friendly, by reducing workload, and in that way increase the quality of life at the farm, in some instances, appears to be the goal of the innovation project.

The appearance of innovations among milk processing firms varied considerably. Product innovations are more apparent, although in some cases these are accompanied by small-scale process innovations. It should, however, be noted that based on the experiences that were revealed by the study's key informants (representatives of firms and supporting agents), large-scale innovation projects are fairly uncommon within the milk processing industry. Nevertheless, in the case of one of the firms visited, an innovation project actually incorporated introduction of a product that was new to the Icelandic market. The study's informants agreed on that expansion of sales is the primary goal of innovation in the milk processing industry. The representatives of the firms, which were visited expressed that there is high interest within their firms to participate in innovation projects in the future. Development of new value-added products is what the informants see as the most attracting innovation projects. Increased cooperation with other branches of the food processing industry is also believed to hold some innovation potentials. The exact project ideas that were mentioned as realistic future projects, however, consisted of initiatives fairly incremental in nature, mostly concerning expansion of existing product lines.

4.3.4 Cooperation and networks

The innovation processes found in this study varied somewhat in the context of key contributors and networking activities associated with the process. Overall, the processes seem to be based to a considerable extent on each innovators personality and the circumstances of the individual firm.

Innovations at the farm level seem to be primarily based on the farmer's own initiative and informal information gathering, rather than on official requests for advice or information from various institutes or support agents. The key contact persons of farmers in relation to innovation processes are other farmers (colleagues) mostly within the region but also at the national level, as well as other personal contacts (family, friends, etc.). Horizontal networking is, therefore, the name of the game. Other agents that were mentioned as having a vital role in

the process were suppliers/sellers of new equipments, and financial institutes. The financial institutes were commonly mentioned as gatekeepers, since without support/communication/cooperation with these institutes few projects could be launched. A sector-specific financial institute, i.e. the Agricultural Loan Fund, seems to have the strongest role among those. However, in Skagafjörður district financial services offered by the local cooperative, i.e. KS, which also runs the local dairy plant, also has a quite significant role.

In regard to consultation- or advisory services, the local/regional farming extension services seem to be the far most common agent that farmers communicate with in relation to innovation projects. The extension services were also commonly mentioned as likely contributors in the context of possible future innovation projects. The extension services also seem to have a role as intermediary agents, linking farmers with educational institutes and financial institutes. It should be noted that, in some instances, not even the extension services had a role in innovation projects, meaning that these projects took place with out any input from formal advisory services. With one exception, the farmers had no direct linkages to research institutes or the agricultural colleges in association with innovation projects

Ideas originate from various sources. Other farmers (colleagues) are the most common source mentioned and in that context organized farm visits, commonly planned by local/regional cattle farmers associations, create an important communication channel. Equipment exhibits and promotional efforts of equipment suppliers also seem to be an important source of ideas for innovation initiatives.

The processing plants that were studied had extremely extensive cooperation networks with a wide range of players. However, in association with innovation projects it seems reasonable to argue that five groups have the most evident role: 1) representatives of marketing bodies or parental firms, 2) sellers of equipment, packaging and other supplies, 3) other firms in the same field or other fields within the broad spectrum of food processing industry, 4) buyers/clients (e.g. people participating in focus groups and trials of new products), and 5) colleagues and personal contacts, mostly old school-mates abroad. Public research institutes, educational institutes, as well as local or regional economic development corporations, seem to have a very irrelevant role in this context.

4.3.5 Innovation conditions

Milk production and the dairy industry in Iceland exist in a very rigid business environment, the influential factors being for example a state-controlled production quota system and specific rules affecting the competition among milk processing firms (dairy plants). These overarching characteristics of the business environment greatly affect innovation opportunities and innovation processes within the industry.

The factor that was most commonly mentioned as hindering for innovation, by the farmers, was associated with the very nature of the production quota system. In this context the farmers saw innovations and expansion go hand in hand. The high (and constantly increasing) market price of production rights is regarded a barrier for those who want to enlarge their production units. At the same time this is seen as hindering for innovation, since larger units create higher revenues, which allow for greater investments in new technology and other initiatives at the farm that can be considered as innovations. Apart from the high price of the production rights, the farmers, who were visited, generally did not seem to be overwhelmed

by different hindering factors. Although, few additional factors were mentioned, the farmers more commonly mentioned that it were actually up to themselves to be determined enough to see new ideas through. The representatives of the support agents, however, agreed on several factors, in addition to the production quota system, that they regarded as possible barriers for innovation in farming. The most commonly mentioned factor by this group were problems with funding of new initiatives (access to loans and high interest rates), lack of access to specialized advisory services in the field of financial management (cost-benefit analysis) as well as in regard to agricultural engineering (advice on new technology and buildings).

The limited size of the Icelandic market for dairy products and the fact that exporting of Icelandic dairy products is very underdeveloped, is probably the most obvious barrier for extensive innovations within the milk processing industry. This was clearly reflected in the views of those interviewed who were associated with the milk processing industry. From the processing perspective, lack of time and human resources was also seen as a major hindering factor for innovations (incremental and large scale). Financial risk, as well as high costs of finance, were also mentioned as barriers, especially for the smaller firms. In the view of the representative of a dairy corporation located outside the region (parent company to one of the dairy plants within the region), lack of initiative and strategic efforts by the regional dairy plant was believed to stand in the way of potential innovations. Lastly, lack of effective channels for distribution and marketing was regarded a serious challenge by several of the respondents at least in the context of certain types of products.

A minority of the representatives of both farm operations and processing firms had any awareness of specific official policy measures, which target economic development or innovation facilitation at the local, regional, or national level. In those instances where the informants indicated some knowledge of such initiatives for the national level, the aspect best known seemed to be the fact that the policy mainly targets other regions than the Northwest region. Also, in those instances where the informants possessed some knowledge of the national policy environment, the name of the Institute for regional development commonly came up in association with the discussion. Not a single representative of the farms or the processing firms had any awareness of any specific innovation policy (science and technology policy).

The representatives of the supporting agents generally knew that a national development policy for rural regions existed. Knowledge of the actual policy document and the associated plan, however seemed to be very incomplete, and only one of the representatives could name the policy document with its official name. Majority of the supporting agents were aware of the recently approved policy document of the National association of cattle farmers and seemed to associate it with innovation and future development of the industry.

The interviewees generally expressed that they experienced quite mixed general attitudes towards entrepreneurship and innovations in their local surroundings (community morale). Majority of the informants, however, saw the morale as more to the positive side than to the negative side.

The strong leadership role taken by the local cooperative in Skagafjörður district (KS) was mentioned by almost all interviewees, who were knowledgeable on the local circumstances in Skagafjörður district, as a very facilitating factor for the development of milk production and the dairy industry within Skagafjörður district. The cooperative, which also runs the local

dairy plant, has in the past decade or so actively encouraged farmers to increase their production by assisting farmers financing the purchases of production rights (provision of loans with very low interest rates). This strategic move by KS seems to have increased optimism and the innovation efforts within the industry in the district.

4.4 Findings from the study of the tourism industry

This chapter contains the key findings from the empirical data gathering of the case study of tourism industry in the Northwest region. As noted earlier the study focused specially on those aspects of the industry, which utilizes special aspects of the study areas' culture and natural environment to create various recreational services offered to tourists.

4.4.1 Background information

Sixteen interviews were carried out with people involved in the tourism industry in the Northwest region. Table 9 list the categories of interviewees as well as the number of interviewees within each category.

OVERVIEW OF INTERVIEWEES ***Case study of the milk production and the dairy industry in the Northwest region***	**Focus (market/operational area)**	**No. of interviews**
Tourism operators: Representatives of firms offering recreational services to tourists	Varying	8
Supporting agents: Representatives of economic development corporations	Local/regional	3
Representative of a marketing bureau	Regional	1
Representatives of industry associations	National	2
Representatives of a tourism association (grass root organization)	Regional	1
Representatives of educational and research institutes	National	1
	Total:	16

Table 9: Categories of informants and number of informants interviewed in association with the case study of the tourism industry in the Northwest region.

As seen in the table above, the interviewees included representatives of tourism operators as well as representatives of various support agents which are associated with or provide services to the industry at the local, regional and national level. Majority of the tourism firms visited were less than 10 years old, although there were also examples of firms with over 20 years experience in the industry. The annual turnover of the firms most commonly were between 5 and 40 millions ISK[380], and the number of man-years were between three and seven. Most commonly, majority of the firms' clients were foreign visitors.

4.4.2 Knowledge and competence base

The educational level and background of the representatives of the tourism firms turned out to be very varied. Most of the interviewees could be regarded as multitalented people, who usually possessed varied occupational experiences. The interviewees include a carpenter, a mechanic, a chef, a sailor (ship captain), and a teacher, to name some examples. One of the

[380] Exchange rate: ISK / 87 = Euros.

representatives possessed a diploma in tourism studies. With one exception, the interviewees did not possess a university degree. The interviewees indicated that majority of the jobs at their firms did not call for higher education. However, some of the interviewees highlighted that to be able to successfully run a tourism operation a very broad range of skills and competences were needed, this especially applied to the smaller businesses where specialization of employees is limited. Also the importance of good social skills and sensitivity for customers' needs, as well as good language skills, were stressed as extremely important aspects of the competence base necessary for succeeding in the industry.

Majority of the firms expressed the view that improved knowledge and competence base would strengthen the firm's innovation potential for the future. Basic business administration skills and marketing know-how were commonly mentioned as areas that could do with some improvement. A vast majority of the firms aim to participate in short term training courses regularly and majority of the interviewees named a course recently completed. Majority of the firm representative (regardless of the size of business) expressed that they would like to be more active in gathering of new knowledge and competences. They also generally expressed that they would prefer being able to access training within the region, since having to travel to places outside the region (e.g. to Reykjavík) would be both costly and time-consuming. The lack of time and financial resources were seen as the main hindering factors for more active development of the knowledge and competence base. It should be noted that the interviewees commonly associated the discussion of their needs for new knowledge with the every day activities of the firm, rather than with the implementation of specific novelties. There were, however, some exceptions form this, particularly with the more recently established firms.

4.4.3 Innovation activity

Examples of innovation projects can easily be found within the tourism industry in the Northwest region. In this respect the firms visited could broadly be divided into two groups. Firstly a group of fairly young firms, which had been operating for five years or less, and secondly a group of mature firms with over 20 years experience.

The group of the younger firms in most cases were still in the process of firmly establishing their operation. This process in many cases included a series of small improvements and additions to their product range. These small steps could, in many cases be regarded, as incremental innovations, based on the definitions of the concept of innovation, which this study is built on. Some of these projects also included development of products that were new to the regional market. The level of novelty of the innovations found, therefore, in some cases exceeded the "in house" level. Basic expansion and increased revenues seemed to be the primary goal of innovation projects found at the younger firms.

The innovation activities found among the mature firms were also mostly associated with product innovations, commonly with the aim of adding new products to an already established product range (e.g. adding a bird watching tour to a previous range of other out-door activity tours). The goal of these projects was, therefore, to create a greater variety of products. Innovative activities of these firms generally also aimed at finding ways to extend the tourism season and in that way creating increased turnover on a yearly basis. Examples of process innovations were also found among the mature firms, e.g. the initiation of a new marketing strategy aiming at increasing direct marketing to end-buyers instead of going through multilevel marketing channels. Another example of a process innovation was found

at a horse-rental and horse-touring firm. This firm had recently contracted local experts in horsemanship to provide the horses for all tours, instead of having the firm owning its own horses. The aim of this project was to improve the overall quality of the services.

4.4.4 Cooperation and networks

The level of cooperation and networking found among the tourism firms varied considerably. Innovation processes reached from being almost entirely based on the innovator's own initiative to being a complex interactive process including a variety of players. Generally the smaller and younger firms rely to a greater extent on communication with various support service providers in relation to innovation projects, while the more mature and larger firms carry out their project more independently and/or rely more on direct relations with clients or client groups (travel agencies) as well as on relations with various personal contacts. The younger and smaller firms also primarily network with local, regional and in some cases national agents. While the larger and more mature operations prefer to network with agents at either the national level or most preferably agents abroad.

Majority of the firm representatives had been in contact with one or several financial institutes of various sorts in relation to the development of innovation projects. The representatives commonly expressed some frustration in regard to services of financial institutes and the overall access to funding.

Majority of the firm representatives had been in some contact with the local and regional economic development organizations and tourism development officers, although the smaller firms generally regarded such contacts as more valuable than the larger ones. Some of the firms, which were visited, were members in the Icelandic Travel Industry Association (SAF). These firms generally had positive experiences associated with their membership and regarded the association as a source for advice in relation to innovation projects. Other firms and the industry association were also regarded as important sources of ideas for new innovation projects, although ideas seem to originate from various other sources as well.

The more recently established firms seem to seek for advice and training at educational institutes in associations with innovation projects. While the larger and more mature firms more uncommonly do. Hólar College, which is located in the Northwest region and offers courses and programs in various fields related to rural tourism, was the educational institute most commonly mentioned by those firms that were active in this arena.

4.4.5 Innovation conditions

Tourism, as an organized industry, is a fairly young phenomenon in rural Iceland. Majority of firms are relatively young and the development of support services, industry coherence, as well as research and education, is still very much in a changing phase. Most regions in Iceland, the Northwest region included, however, possess a handful of mature firms, which in the last couple of decades have experienced great expansion and drastic changes of the business environment for the industry. The views of the representatives of the mature firms, who contributed to this study, were very much affected by the fact that these firms have survived rather turbulent times.

An overall lesson from this study is that tourism in the Northwest region seems to be a very tough business. Usually it seems to take many years to establish a profitable business.

Meanwhile the firms struggle to make ends meet with revenues that hardly allow for minimum wages and very low, if any, return on investment. The seasonality within the industry is furthermore a great challenge. All these general factors of the business environment also affect the innovation potentials and the general motivations of firms.

The factor that was most commonly mentioned as hindering for innovation by the study's informants was the high cost of finance, as well as the unavailability of venture capital or development grants. This seems to affect those firms that solely focus on recreational service in the most severe way, since they have more difficulties in providing the necessary collaterals. The recently established firms' access to markets, more precisely finding marketing channels that work, also seems to cause considerable bottleneck problems for innovation processes.

A minority of the firm representatives expressed much awareness of specific official policy measures, which target general economic development or innovation facilitation at the local, regional, or national level. Also not a single interviewee (firms and supporting agents) had knowledge of any specific innovation policy (science and technology policy). The representatives of the supporting agents generally had some awareness of the existence of a development policy for rural regions at the national level. Knowledge of the actual policy document and the associated plan, however, seemed to be quite limited. A vast majority of the supporting agents had some knowledge of the currently on-going policy initiative of the Ministry of transportation. The visibility of this industry-specific initiative, therefore, seems to be quite good.

Some of the interviewees expressed that they experienced quite positive community morale in their home community while others found the community morale quite pessimistic and discouraging for innovation activities. No clear trends were, therefore, found in regard to the general attitudes towards entrepreneurship and innovations in the innovators' environment.

4.5 Conclusions

The Northwest region of Iceland fits well the criteria of the ISP project for the selection of study regions. The region includes a mixture of sparsely populated communities and small urban centers. It is located in a considerable driving distance from Iceland's only major urban area, i.e. the capital area, and does not include a major research- or university center. The region is traditionally a food-production region, and hence is shaped by the traditional economic structure of rural Iceland. Tourism development has, furthermore, very much been looked at as a strategy towards diversification of the local economies within the region. Tourism is currently an important part of the regional economic landscape and a considerable amount of tourism development efforts are taking place.

In the following paragraphs the main conclusions of the Icelandic contribution to the ISP study will be summed up, with the project's key research themes forming the basis for the structure of the discussion. It should be reaffirmed that the chosen research approach, i.e. a case study approach, is not a survey, where reliability relies on the characteristics of the data collection tools, the sampling techniques and the sample size. It should also be emphasized that when choosing the types of research tools for the project and when designing the actual tools and procedures, the intention was not to collect data for statistical inference. Generalizations from the conclusions below should, therefore, be approached with caution. The case study approach, however, allows for systemic analysis and the identification of common themes, patterns and trends. The results of such an analysis, therefore, should add to our knowledge on innovation processes within the chosen sectors in rural Iceland and in that way contribute to a discussion on the design and implementation of innovation policy and innovation facilitation practice in the rural context.

Innovation activity

Building on the ISP project's relatively broad definition of the concept of 'innovation', it turned out to be an easy task to find examples of innovative firms in the Northwest region. This applies to both sectors studied, i.e. the tourism sector and the milk production and the dairy industry. Although many of the innovations found were small-scale and not representing implementation of novelties that can be regarded as 'new under the sun', these examples demonstrate that innovation is possible and currently taking place in the study region. For those firms that actively participate in innovation, the innovation process commonly seems to be considered necessary to stay in business and in that way seems to be looked upon as a survival strategy. Although the discussion above describes a pretty picture, it should be stressed that for many of the firms found in the Northwest region, success has evidently not come easy, but is a result of a great determination, hard work, entrepreneurial spirit and sometimes a sprinkle of luck. The attitude described above, i.e. to consider innovation as a necessity for survival, also seems to be a crucial ingredient.

Based on the findings described above, it can be argued that it is important that policy maker and rural development practitioners (e.g. economic development officers, community leaders, leaders of industry associations, etc.) adopt and promote a certain attitude towards doing business and carrying out initiatives, among colleagues and clients. These agents have a key role in creating an understanding that innovation is a cross-sectoral phenomenon, that it is possible, and indeed necessary for firms and organizations to maintain their edge. Such an

advocacy role, calls for the use of efforts that aim to raise the awareness of the importance of innovation, among businesses, entrepreneurs, public organizations and the public. The existence of examples, as those found by the ISP project, should strengthen such efforts and encourage policy makers to take on a proactive approach aiming at facilitating innovation in rural regions.

Knowledge and competence base

Various forms of practical knowledge and gained experience, as well as personal traits such as entrepreneurial spirit, are the most evident building blocks for innovation in the firms studied. This applies both to the tourism firms and the agrifood firms. In addition, trade- and craftsmanship, and/or certain types of technical know-how are also important both in farming and food processing, while various occupational experiences and social skills seem to be important building blocks for innovation within the tourism sector. As can be seen from the above, the knowledge and competence base, which innovations are drawn from, could be regarded as informal and generated by experience, rather than building on scientific knowledge generated by university education. The firms, furthermore, have limited contact or cooperation with educational institutes in general, as well as with research organizations. Although some of the firm representatives seem to be quite active in seeking new knowledge, this is most often not directly linked to innovation projects, but rather to the every day practical activities within the firm (e.g. accounting, computer use, etc.). The primary common need for strengthening the knowledge and competence base (identified by both tourism and food processing representatives), were needs for more extensive knowledge on markets, marketing and sales. Utilization of educational offerings seems to be highly sector-oriented. This applies to a certain extent both to the tourism firms and the agrifood firms, but is especially evident among farmers who seem to be quite locked within the agricultural education system.

Given the nature of innovation activities and the current status of the knowledge and competence base found by the study, policy makers should aim at strengthening the role of educational institutes within the Northwest region, especially their input and involvement in various general capacity building efforts as well as their outreach to firms. Specific relevant knowledge areas also seem to call for increased attention, e.g. areas such as marketing and product development. Sectoral lock-in also seems to limit farmers' utilization of programmes of value for alternative farm activities and of value for the general broadening of their basic knowledge base. A broad range of educational institutes should, therefore, have a role and unconventional institutes/players should be included in the discussion on further development of educational offerings within the region.

Cooperation and networks

Horizontal relations (firm to firm) seem to be an extremely important part of the systemic aspect of innovation processes. This applies to both of the sectors that were studied. Clients, suppliers, personal contacts, and colleagues play a key role in the innovation process; in most cases a quite stronger role than various public support providers.

In regard to consultation- or advisory services, the local/regional farming extension services seem to be the only (if any) agents that have a quite significant role in farmers' innovation activities. The extension services also link farmers with institutes at the national level. The

processing plants, however, had hardly any contact with the local or regional support service providers (e.g. the economic development corporation), but seem to rely almost solely on the above-mentioned horizontal relations on a national or even international level.

The level of cooperation and networking found among the tourism firms varied considerably. Generally the smaller and younger firms rely to a greater extent on communication with various support service providers in relation to innovation projects, while the more mature and larger firms carry out their project more independently and/or rely more on direct relations with clients or client groups (travel agencies) and personal contacts. The younger and smaller firms also primarily network with local, regional and in some cases national agents, while the larger and more mature operations prefer to network with agents at either the national level or most preferably agents abroad. The majority of the tourism firm representatives had been in contact with several financial institutes in relation to innovation projects. The representatives commonly expressed some frustration in regard to services of financial institutes and the overall access to funding.

Again sectoral lock-in is very much a central theme of the findings, i.e. firms primarily look for cooperation, advice and consultation from agents within their industry sector. The sectors, which were studied, both have a key role in the economic landscape of the Northwest region and could evidently benefit from more cooperation, e.g. in relation to branding of products, marketing, and alternative farming practices such as farm tourism. In Skagafjörður district there are already some development initiatives taking place that aim at creating better linkages between the production of local food and tourism[381]. Such initiatives should be strengthened and considered as a strategy in other parts of the region. It should, however, be kept in mind that it is very important that such initiatives are not solely building on the work of (cross-sectoral) development workers, but actively including industry groups and industry leaders, who can ensure commitment of the relevant sectors to such projects.

Policy situation and innovation conditions

Transparency of the national cross-sectoral policy environment (including both the policy of the Science and Technology Policy Council and the rural development policy) seems to be fairly poor. Awareness and familiarity with different policy initiatives is limited, especially among firm representatives, but also among many of the representatives of the different support organizations. This applies to both sectors. Awareness and familiarity with industry specific policies of the state, as well as policies set by industry associations, however, seem to be considerably better. The findings above can be interpreted in at least two ways. Firstly we can argue that the visibility and coherence of the cross-sectoral policy environment should be improved with an emphasis on reaching the attention of the so-called end users. Secondly we need to ask how we can make cross-sectoral policy measures, both innovation policy and rural policy, more conscious of the needs of specific industry sectors, but at the same time encouraging cross-sectoral cooperation that can appeal to different industry actors.

Specific planning for economic and social issues for the Northwest region does not exist and it seems quite evident that many aspects of the regional cooperation could do with some improvements for the purpose of maximizing the regional capacity, creating stronger

[381] See further information on the project '*Food Chest Skagafjörður*' at http://www.holar.is/matur/ensk.htm.

bargaining power and minimizing problems associated with the peripheral location of the region. This applies especially to cooperation between various agents from the region's different districts, i.e. Skagafjörður district on one hand and Húnavatnssýslur counties on the other. In addition to planning issues and other issues adhering under the region's different municipal government, examples of cooperation arenas that should be strengthened include cooperation between tourism firms and cooperation between some of the support agents, e.g. the agricultural extension services that operate within the region. Many players, therefore, evidently have a role in strengthening the regional cooperation, including municipal leaders, economic development practitioners, and leaders of industry associations.

A broad range of support agents offer services to firms on the local, regional, and national level and could be regarded as having a role in innovation facilitation in the Northwest region. The findings of the study, however, indicate that many of these agents play a fairly insignificant part in the context of innovation activities of firms in the region. This indicates that many of the support agents should strengthen their outreach to the business community for the purpose of improving their visibility and their level of effectiveness.

When looking at the two sectors studied, there seems to be a considerable imbalance between the attention, which the two sectors are receiving in the form of specific development projects organized by public support agents. Tourism is receiving a considerable attention, while farming and food processing receive a very limited attention[382]. This imbalance is especially evident in the efforts of agents that operate on a cross-sectoral level, e.g. the regional economic development corporation and local economic development officers. The industry structure of farming and food processing exists in a very rigid business environment, is built on long-standing tradition and controlled by a few strong operations (processors). The tourism sector is, on the other hand, built up by many, varied, mostly young, and relatively vulnerable players and the industry structure and coherence is still very much in a changing phase. In spite of these evident differences between the two sectors, there are evidently some opportunities for innovation within both of them. It, therefore, seems reasonable to argue that both sectors deserve some attention and that public agents should aim at facilitating innovation in both sectors for the purpose of strengthening the regional economy and sustaining its competitive status. Blönduósbær municipality has in its economic development policy put a special emphasis on the strengthening of the food sector and some concrete development projects are already in the process. In this respect Blönduósbær has taken an initiative, which others should follow. Especially since the municipality alone, has limited capacity to reach major milestones and could do with some assistance from other regional and national agents.

Systemic aspect of innovation processes

Some evident differences were found in the systemic aspect of innovation processes between the case on tourism and the case on the milk production and the dairy industry. The systemic aspect, however, seems to be quite sector-oriented in both cases, rather than oriented towards the defined geographical study area, i.e. the Northwest region.

[382] Note: It should be emphasized that here we are referring to specific innovation-related projects or task forces, not the general services meant for supporting the every-day activities of firms.

- *Agrifood:* The systemic aspect is purely sectoral. Firms rely on relations with other agents within the sector and with sector-specific service providers. This is especially evident in the primary production phase (farming), where the local and regional environment is the most important platform of networking.
- *Tourism:* the systemic aspect has weak geographical underpinnings. The (rural/peripheral) location of the firm is, therefore, not a crucial element. Firms seem to seek for direct relations with partners at the national and/or international level.

From the findings above, we conclude that we should be cautious of using the term *regional innovation systems* to describe the systemic aspect of the innovations found in the Northwest region. This conclusion should encourage local and regional support agents to strengthen their role as intermediary agents between local firms and national and international support agents and business networks.

4.6 Summary

Research context

The Northwest region was chosen as a study area for the Icelandic contribution to the ISP project. The region has a population of just over 9.000 and includes a mixture of sparsely populated communities and small urban centers. The two sectors, which the study focused on, were the tourism sector and the agrifood industry, with an emphasis on milk production and the dairy industry. The Northwest region is traditionally a food-production region, and hence is very much shaped by the traditional economic structure of rural Iceland. Currently there are about 90 farms producing milk in the study region[383] and two dairy plants are operated, producing a variety of products that are sold both regionally and nationally. The tourism industry in the region relies, to a greater extent than many other Icelandic regions, on organized activities and events as attractions for tourists. The region is renowned for activities as salmon and trout fishing, activities associated with the Icelandic horse, as well as several cultural activities focusing on different aspects and time periods of the region's rich history. The Icelandic Tourist Board Registry includes around 115 tourism firms located in the Northwest region.

Innovation activity

Many examples of innovative practices were found by the study. This applies to both sectors studied. Although many of the innovations found were small-scale and incremental in nature, these examples demonstrate that innovation is possible and currently taking place in the study region. Innovation processes commonly seem to be considered necessary to stay in business. In that way innovation seems to be looked upon as a survival strategy. Although the discussion above describes a pretty picture, it should be stressed that for many of the firms found in the Northwest region, success has evidently not come easy. It can be argued that it is important that policy maker and rural development practitioners adopt and promote a certain attitude towards doing business and carrying out initiatives. These agents have a key role in creating an understanding that innovation is a cross-sectoral phenomenon, that it is possible, and indeed necessary for firms and organizations to maintain their edge. The existence of examples, as those found by the ISP project, should strengthen such efforts and encourage policy makers to take on a proactive approach aiming at facilitating innovation in rural regions.

Knowledge and competence base

Various forms of practical knowledge and gained experience, as well as personal traits such as entrepreneurial spirit, are the most evident building blocks for innovation in the firms studied. In addition, trade- and craftsmanship, and/or certain types of technical know-how are also important both in farming and food processing, while various occupational experiences and social skills seem to be important building blocks for innovation within the tourism sector. The knowledge and competence base, which innovations are drawn from, could, therefore, be regarded as informal and generated by experience, rather than building on knowledge generated by university education. The firms, furthermore, have limited contact or cooperation with educational institutes in general, as well as with research organizations. The primary common need for strengthening the knowledge and competence base (identified in both sectors), were needs for more extensive knowledge on markets, marketing and sales.

[383] The study area for the case on the milk production and the dairy industry in the Northwest region, only includes Skagafjörður district and East Húnavatnssýsla district (i.e. excluding the West Húnavatnssýsla district).

Policy makers should aim at strengthening the role of educational institutes within the Northwest region, especially their input and involvement in various general capacity building efforts as well as their outreach to firms. A broad range of educational institutes should, have a role and unconventional institutes should be included in the discussion on further development of educational offerings, e.g. for the purpose of limiting a sector lock-in.

Cooperation and networks

'Firm to firm' relations seem to be an important part of cooperation associated with innovation processes. Clients, suppliers, personal contacts, and colleagues play a key role; in most cases a stronger role than various public support providers. The farming extension services seem to be the only agents that have a significant role in farmers' innovation activities. The extension services also link farmers with institutes at the national level. The processing firms, however, had hardly any contact with local or regional support service providers, but rely almost solely on the above-mentioned horizontal relations, nationally and internationally. Generally the smaller and younger tourism firms rely to a greater extent on communication with support agents, while the more mature and larger firms are more independent and/or rely more on direct relations with clients, travel agencies and personal contacts. The younger and smaller firms also primarily network with local, regional and in some cases national agents, while the larger and more mature operations prefer to network with agents at either the national level or most preferably agents abroad. The majority of the tourism firm representatives had been in contact with several financial institutes in relation to innovation projects. The representatives commonly expressed some frustration in regard to services of financial institutes and the overall access to funding. The sectors studied could evidently benefit from more cross-sectoral cooperation, e.g. in relation to branding of products, marketing, and alternative farming practices.

Policy situation and innovation conditions

Awareness and familiarity with different cross sectoral policy initiatives seems to be limited (including both the policy of the Science and Technology Policy Council and the rural development policy), especially among firm representatives, but also among representatives of different support organizations. Awareness and familiarity with industry specific policies, however, seem to be considerably better. We, therefore, argue that the visibility and coherence of the cross-sectoral policy environment should be improved with an emphasis on reaching the attention of the so-called end users and with an emphasis on a higher level of conscious of the needs of specific industry sectors.

Specific planning for economic development for the study region does not exist and it seems quite evident that many aspects of the regional cooperation could do with some improvements for the purpose of maximizing the region's capacity and bargaining power and minimizing problems associated with the peripheral location. Many players evidently have a role in strengthening the regional cooperation, including municipal leaders, economic development practitioners, and leaders of industry associations. A broad range of support agents offer services to firms on the local, regional, and national level. The findings of the study, however, indicate that many of these agents play a fairly insignificant part in the context of innovation activities of firms in the region. This indicates that many of the support agents should strengthen their outreach to the business community for the purpose of improving their visibility and their level of effectiveness. Innovation in tourism is currently receiving considerable attention by support agents through the implementation of specific innovation-related project. The food industry could do with increased effort in this direction by public organizations.

Systemic aspect of innovation processes

Some differences were found in the systemic aspect of innovation processes between the two cases:

- *Agrifood:* The systemic aspect is purely sectoral. Firms rely on relations with other agents within the sector (firms and service providers). This is especially evident in the primary production phase (farming), where the local and regional environment is the most important platform of networking.
- *Tourism:* The systemic aspect has weak geographical underpinnings. The location of the firm is, therefore, not a crucial element. Firms seek for direct relations with partners at the national and/or international level.

Based on the above, we conclude that we should be cautious of using the term *regional innovation systems* to describe the systemic aspect of the innovations found in the Northwest region. These findings should encourage local and regional support agents to strengthen their role as intermediary agents between firms and national and international support agents and business networks.

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CHAPTER 5: Case studies from Norway

5.1 The research context

This project is fundamentally driven by the ascertainment that so-called high-technology economic activities (typically telecommunications and pharmaceuticals) in densely populated areas have received exaggerated attention in recent years, at the sacrifice of so-called low- and medium tech economic activities and industrial activity in less densely populated areas. It is a fact that large and important shares of industrial and economic activity are located in the periphery of the Nordic countries, i.e. outside the larger towns and far away from the capital areas. And it is a fact that the industries in the periphery mainly belong in a category in which research certainly not is a main component in innovation.

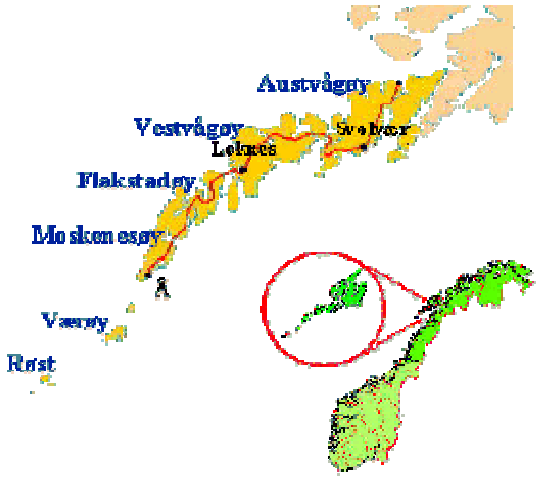
The project partners have chosen different peripheral regions in the Nordic countries. In the Norwegian context we have chosen the region Lofoten in the northern part of the country.

5.1.1 Rural Norway

Norway can be characterised as a vast sparsely-populated area (14 persons per km2). It has harsh climates, distant from the main European population centres and other international markets. ¾ of the population live along the long coast line. In some rural areas where agriculture is important, population is scattered, in other areas, population may be concentrated in small villages, and towns, often divided by vast uninhabitable territories (mountains, glaciers, rivers, islands, and fjords). The location of these population pockets often is determined by historical advantages of natural resources, like fishing grounds or sub-sea oil fields at sea, water falls making local sources of energy, mines, etc. The rugged topography creates barriers of transportation.

This peculiar geography has in many areas prevented, in other areas heavily modified, the development of a hierarchical "Crystallerian" regional centre structure, where the market all by itself may supply rural areas with services, through a system of cities. This lack of a hierarchical city system with "natural" regional centres, created by the market, throws the idea of "region" into doubt in Norway. One might ask weather Norway actually *has* regions, or weather the country just consists of a collection of localities, towns, and minor cities, interconnected through a complex, far-reaching, and expensive transportation system.

5.1.2 Profile of region Lofoten, Northern Norway



Geography

Lofoten is the archipelago to the west in the ocean, north of the Arctic Circle, at the 67th and 68th degree parallels. The principal islands are Austvågøy, Gimsøy, Vestvågøy, Flakstadøy, Moskenesøy, Værøy and Røst. The southernmost part of Norway´s largest island, Hinnøy, is also in Lofoten. The total land area amounts to 1,227 sq. km. About 24,500 people live there. The road distance is almost 170 km from Fiskebøl near Vesterålen in the north east to Å in the south west, where the E10 ends. From Lofotodden, at the south end of Moskenesøy Island outside Å, the air distance is more than 60 km to Skomvær, the southernmost point in Lofoten.

Lofoten stretches like a wall of mountains to the southwest in the sea. Between the mainland and the "Lofoten Wall" lies the Vestfjord. Lofoten consists of mountains and peaks, wide open ocean, sheltered inlets, stretches of seashore and large virgin areas.

Lofoten has airfields in Svolvær, at Leknes and at Røst. There are daily departures for Bodø. A helicopter service has been opened between Værøy Island and Bodø. The Coastal Express calls at Stamsund and Svolvær, both on the way north and on the way south every day.

There are bus connections with Vesterålen and Fauske/Bodø, with further connections by train. Vesterålen and Bodø are served by express boats from Svolvær. There are also bus and express boat services to Narvik. From there it is possible to travel further by train to Sweden. The ferry between Svolvær and Skutvik is the connection to the E6. When heading towards Vesterålen, people take the ferry from Fiskebøl to Melbu. A project has been started to provide a ferry-free connection to the mainland. It will be opened in 2007. There are ferries from Moskenes to Bodø and routes in the south to Værøy and Røst, which also have daily ferry service to Bodø. Bridges and tunnels have replaced the ferries between the largest islands in Lofoten.

Due to the warm Gulf Stream, Lofoten has a much milder climate than other parts of the world at the same latitude, such as Alaska and Greenland. The coastal climate in Lofoten makes the winters mild and the summers relatively cool. January and February are the coldest months, with an average temperature of -1°C. July and August are warmest with an average temperature of 12°C. May and June are the driest months, with an average 40 mm of rainfall.

History

The first people came to Lofoten about 6,000 years ago. Lofoten´s Stone Age inhabitants survived on fishing and hunting in an area which provided good living. All of Lofoten was covered by large pine and birch woods at that time. There were deer, bear, wild reindeer, lynx and beaver, and the sea was full of fish, seals and whales. Agriculture developed early, and grain was harvested in Lofoten as early as 4,000 years ago.
The Viking Era saw the emergence of several large chieftain seats. Tofts from a Viking chieftain seat have been found at Borg on Vestvågøy Island, containing the largest Viking banquet hall ever found in any country. The building was 8.5 metres wide and as much as 83 metres long. A reconstruction of the building has been raised, and the Viking Museum, LOFOTR, at Borg opened in June 1995.

The Lofot Fisheries early gained importance. King Øystein considered these fisheries to be of such significance that he, as early as 1103, built a church in Vågan, which at that time was the base of the Lofot fisheries. In about 1120, he also built the first fishermen´s huts ever mentioned in the Saga.

Stockfish, produced from spawning cod, was the staple good, and it was sold to almost all of Europe. Italy is still the most important market for high-quality stockfish from Lofoten.
Near Kabelvåg is the location of Vågar, the only medieval town of the North Calotte. From the 14th century on, Lofoten had to pay taxes to Bergen. This was the beginning of an economic dominance which lasted for 600 years, first executed by the German Hansa tradesmen, and then by their Norwegian heirs. Changing times with bad years and poverty were succeeded by periods of good years and wealth. Following the 1860s came the large herring migrations which were the basis of growth, prosperity and immigration. The foundation of today´s settlement was laid.

5.1.3 Few facts on the agrifood industry (milk, dairy and meat) in Norway

Norway is the northernmost country in Europe. Its mainland extends from 58º to 71º North, a total distance of about 1 750 km, greater than the distance between Oslo and Rome. The country's population density is 14 people per km2, the second lowest in Europe (only Iceland has a lower density).

The main productions are dairy and meat products, eggs, cereals and temperate fruits and vegetables. About three quarters of farm income is derived from livestock production and one quarter from crop production. The production is almost entirely destined for the national market and plays an important role in ensuring national food security, sustaining the viability of rural areas and safeguarding certain environmental qualities.

Arable land is scattered all over the country and represents only a fraction of the total area in Norway, which mainly is mountainous area. Norway has about 0.2 ha arable land pr. inhabitant. The average farm size is around 16 ha arable land, while the average field size is only 1.5 ha. Only 1/3 of arable land is suitable for cereal production. Generally, this land is located in the lowland of the South Eastern Norway, generally closer to urban areas. Due to, inter alia, unfavourable climatic conditions, the remaining 2/3 of arable land is only suitable for fodder production (basically grass) for the purpose of bovine and sheep meat and dairy production (goat and cow). This land is generally located in the fjord and mountain areas and in Northern parts of the country. Through a set of policies lowland farmers have been

encouraged to stay out of dairy production and concentrate on cereal production, thus allowing the remaining farmers of the fjords, mountains and of Northern Norway to cover a substantial part of the national dairy and meat market.

Table -1-1: Norwegian agriculture, key figures for 2001 if nothing else is stated.

Number of active farm units	64 600
Man-years in primary agriculture	72 600
Contribution to employment	3.9 %
Contribution to gross domestic product	0.9 %
Value of produce from farmer*	17.5 bill NOK
Value of produce from agro-food industry** (1999)	72.3 bill NOK
Man-years in processing industry** (1999)	34592
Self-sufficiency on calorie basis (2000)	49%
Value of agricultural export	3.5 bill NOK
Value of agricultural import	11.5 bill NOK

*Excluding all budget support
** Without tobacco, beverages, and alcoholic items
Source: Norwegian Ministry of Agriculture 2004

The arctic and sub-arctic conditions in Norway are characterised by harsh climate, low temperatures and a short growing season, which varies between 100 and 190 days, largely dependent on latitude and distance from the sea. The indoor period for livestock varies from around 200 to 260 days a year. All the disadvantages stemming from a harsh climate, long distances, a difficult topography, a low population density and a small-scale structure result in high costs and a low degree of competitiveness to world market prices.

In agriculture, Norway faces unusually high production costs for a number of reasons. All the disadvantages stemming from a harsh climate, long distances, a difficult topography, a low population density and a small-scale structure, combined with a general high cost level, result in high costs and a very low degree of competitiveness at world market prices.

Structural adjustment of the agricultural sector has contributed and will continue to contribute to reductions in overall cost levels. Since 1949 the number of farms has been reduced with more than two thirds of total farms, from 213 000 until 58 627 in 2002, which implies that 8 farms have been put down every day.

The total size of agricultural area in use has despite this remained to a large degree unchanged, because the areas from the closed down farms has been used as additional areas at the remaining farms. The average size of the remaining farms has increased and has been more than three doubled I this period from 50 decare to almost 170 decare. The employment in the agriculture sector is also reduced. In 1950 over 20 percent was employed in the agriculture sector, in 2001 this share was around 2.8 percent. The share of GDP for this sector is today under 1 percent.

In Norway the scope cost reductions is relatively limited. Firstly, the potential for structural adjustment in terms of large-scale production is restricted by natural conditions, partly because fields and farms are relatively scattered. Secondly, even with a shift to larger production units, overall costs would still be very high, suggesting that costs relating to labour and natural conditions are very important. In case of dairy production for instance, current production costs are as much as six to seven times higher in Norway, compared with the most cost-efficient producers.

Such an extensive structural adjustment would in addition have a considerable negative impact on important non-trade concerns (NTC) such as rural employment, agricultural landscapes and bio-diversity.

For the interested reader, we have gathered some more core figures about Norwegian agriculture and food production in the appendix.

The value chains

The value chain in the agri-food sector in Norway is to a large degree characterized by close relations between the producer and industry, since the cooperation is owned by the primary producers. There is also a great many actors involved in both upstream and downstream activities in the value chain.

There is no uniform structure of the value chain in this sector. It varies between the different products. Despite this several of the same companies are both involved in upstream as well as downstream activities in the same production groups.

We will now in coarse features present the value chain for green food, milk and meat, since these are the product groups we will be looking at in this case study. In this presentation we will also say something about how this production groups are related to the research and education sector. It is for the most part through this sectors that analytical (research based) knowledge flows into the agri-food sector.

Green food sector

Green food sector consist in 4000 producers of potatoes, vegetables and fruit. They deliver both fresh products for consumption and raw material to the industry. The buyers in the sector have no duty to accept one's co-contractor's performance. This means that the producers are dependent on delivery agreements with producer organization, which in their turn are in relation with chain-stores within the retail distribution.

The producers that deliver fresh products for consumption are often organized in producer groups, which are closely connected with the retailers. For the producers of worked products the integration is lager from the industry and backwards, which again has more or less permanent agreements with the chain-stores.

When it comes to the upstream activity the producers are very dependent on suppliers of seeds, plant protection and other factor inputs. The advisory service to the producers comes often from these suppliers and the receiver of the goods. Many producers are also members of independent organizations like; The Norwegian Agricultural Extension Service, accountancies co-operations etc.

These actors are again in close relations with universities and research milieus, especially Agriculture University of Norway (Norges Landbrukshøgskole), Norwegian Food Research

(Matforsk) and The Norwegian Crop Research Institute (Planteforsk). There is also R&D-cooperation across the Nordic Countries when it for instance comes to seeds, which is a very important part of this sector. It is Graminor that represent Norway in this cooperation. Central and local government administrations are also working for this sector, especially through municipalities' agriculture- and sector offices and counties' agriculture departments (FMLA). At a national level it is especially the Food Regulatory Authority (Mattilsynet) and the Norwegian Agriculture Regulatory Authority (Statens Landbruksforvaltning) that are active towards both primary production and industry.

Dairy

To day there are about 18 000 milk producers in Norway and approximately 97 % of the milk delivery goes to TINE. TINE is regulating the Norwegian market and has therefore duty to accept the co-contractor's performance. There is a few other actors that has a certain size in the Dairy sector in Norway, and that is Q-meieriene on milk consumption and Synnøve Finden on cheese production. Synnøve Finden does not have there own milk suppliers and must therefore buy the milk from their competitor, TINE. The rest of the actors in this sector are rather small and produce farm based niche products. The integration of this sector is strong in the whole value chain from the primary producers to the industry. This is due to the fact that TINE has such a strong position in Norway and is owned by members of the industry.

The upstream- and downstream activity in the dairy sector is not unlike the one for green food sector. A main difference is that the three largest dairy product producers deliver to all stores and chain-stores. TINE is the largest company in Norway in dairy products and has therefore the best developed advisory service. This is also the reason why the chain-stores not are involved in this kind of consultancy work as they are green food sector. There are also other organizations that offer advisory service for the primary milk producers. This can be feed suppliers, the Norwegian Agricultural Extension Service, accountancies co-operations and not at least the Breeding and AI Association, Norway (GENO).

There is also a large research activity in the dairy sector targeted towards the primary producers and some of these milieus are: GENO, Department of Animal and Aquaculture Sciences at the Agriculture University of Norway, Nord-Trøndelag University College and the Norwegian School of Veterinary Science. Research related to the industry in the dairy sector is done in cooperation between TINE and Department of Chemistry, Biotechnology and Food Science at the Agriculture University of Norway and the Norwegian Food Research. The public administration that works for the dairy sector is the same as for the green food sector.

Meat

There is about 25 000 farms in Norway that operates with neat, 20 000 with sheep's and 4000 with pig's. Most of the meat production in Norway is related to milk production and there are rather few farms that have specialized in meat production. Nearly 75 percent of the meat is delivered to Gilde, Which is a farmer owned company. Gilde is a regulating actor in the Norwegian meat market and has therefore duty to accept the co-contractor's performance. There are to-three relatively large actors besides Gilde, but there are also great many small butchers. The manufacture of the meat is more spread than the actually butchering, since there is a large amount of firms that both butch and work up products and firms that buy meat from

the butcher's for further manufacturing. The farm owned industries products are to be found in all chain stores, but some of these stores have also products from private labels.

Upstream there is a close cooperation between the primary producers and the supplier of breeding materials and equipment and when it comes to the industry cooperation on counseling. Regarding research and public management in the meat sector they are the same as for the dairy sector except for Norsvin, which is a breeding association for the pig producers and Norwegian Beef Breeders Association (Norsk Kjøttfeavlslag).

Agricultural policy in Norway

The main goal in Norwegian regional policy is to maintain the settlement pattern and to have equal circumstances for the whole country. The policy shall insure a regional development, which in a sustainable way make use of the whole country (White paper No. 34 (2000-2001)). Regional policy arguments has for a long time been used to support agri-food branch in Norway and used to stimulate the agriculture in the more peripheral areas. The argument is also supported by the fact that Norwegian food is expensive, but it has also been criticized for a high subsidise level compared with other countries.

The multifunctionality of Norwegian agriculture is ensured through a combination of economic, legislative and administrative measures, as well as through training and extension. In 1997, total transfers associated with agricultural policies amounted to US $3 billion. Net budgetary outlays amounted to US $1.7 billion and, thus, accounted for 57% of the transfers, while transfers from consumers through border protection accounted for 43%. Blue Box measures (primarily acreage and livestock support) represent approximately 60% of budgetary outlays, while Green Box measures amount to around one third. AMS policies, basically, account for the remaining budgetary support.

Important parts of the agricultural policy is laid down in the Agricultural Agreement, negotiated between the farmers' organisations and the Government and approved by the Parliament. Support and protection measures in the agricultural sector are not primarily based on income considerations, but aim first and foremost at ensuring a sufficient level of public goods, such as food security, viability of rural areas and environmental protection, demanded by the Norwegian society.

WTO agreement

The agriculture sector in Norway is exposed to stronger market demands, with focus on low prices both by consumers and retail chains, than ever. The structure rationalisation process that the processing industry has gone through during the nineties has become a greater challenge for the individual farmer. Long distances with increased transport costs and environmental consequences are some of the problems.

There is also an increased concern about the international trading agreements. WTO new framework agreement for international trade, which Norway has agreed on, will contribute to a much freer trade with agricultural products across countries. This can end in reduced agricultural subsidies and reduced border restrictions. This can further lead to pressure on prices, less compensation for costs through agricultural agreements and lower volumes of domestic production. On the other hand this lead to increased focus on quality, development of broader product spectre and the exploitation of alternative markets with the farm as an entrepreneurial platform (Borch and Karlsen, 2000).

We do not yet now the consequences this agreement will have for the Norwegian agricultural policy, but we know that this will change things. The size of customs tariffs and export subsidy will be crucial for the competition from the international market.

As an answer to the reorganisation in the agriculture sector in Norway and the changed framework conditions many of the farms are starting up with supplementary niche production or change their whole production into niche products (Berg 2003). Such niche production is as usual based on resources that already are available at the farm. This is also in line with the national agriculture policy in Norway, where the government through different policy instruments wants a more comprehensive activity in this sector. In White Paper No 19. 'About Norwegian agriculture and food production' we find in chapter 5.5.4. local development, this formulation: 'If the agriculture sector shall fulfill the objectives about settlement patterns and added value, the Government wishes to arrange for an overall economic activity also in the more peripheral areas. Such a policy will strengthen and widen the basis for a more comprehensive economic activity and build up the negative settlement pattern in the rural areas' (our translation). This comes together with the acknowledgement that competence, knowledge and attitudes will be important competitive factors together with more specific competitive advantages.

Horizontal innovation policy

The Government has recently realized a plan, which sketches some principles that need to be fulfilled in order to implement a horizontal innovation policy, also concerning the agriculture sector[384]. The plan has ambitious objectives for innovation as one of the most important criteria for value creation in Norway also for agri-food production. So far there has not come any concrete out of this for the agriculture sector.

So far there has been rather little attention to the role of innovation in economic development of traditional and mature industries, in rural and peripheral regions and specially the integration of these industries in national systems of innovation. There is a belief that local or regional agri-food development can be questioned in a situation where world trade in food is being liberalised, food industries are sourcing, producing and selling globally. The taste and habits are also being more international and seems to be converging across countries and different part of the world. It is now widely believed that economic performance of firms, organisations, industries and economic regions in some degree are based on the capacity to innovate.

Trends

The food market seems to be an arena for diverging trends. One trend is the development of new international standards that to a large extent gains the large international companies to source the raw materials for food production wherever they find the cheapest and establish processing firm in and close to the markets. The brands have become more important as established products penetrate new markets.

The other trend is the more small scaled food processing firms which can offer more differentiated food products based on a regional culture, specialities and more traditional

[384] 'From idea to value creation' (Fra ide til verdi), NHD 2003

products. This last trend can also be related to tourism, where food differentiation based on local culture can satisfy a more sophisticated demand.

One of the many British web pages related to local food presents these arguments for buying local food[385].

- Buying local foods support our neighbouring family farms.
- Supporting local farms helps preserve our open landscape.
- Local food is in season, therefore fresher and tastier.
- Many local farms use sustainable eco-friendly methods.
- Supporting local farms keeps our local economy stronger.
- Farmers markets build positive community relationships.
- Decentralizing our food system takes the food supply out of the control of big business.
- Relating food to farmer connects us to nature and the community.

There are number of general policy that can have an effect on regional food production and especially the policy that regulate the production and trade in food product. This can be the Agro-food sector policies like agricultural policy and food sector regulation. It can also be barriers for food trade and is including, tariffs, standards and technical barriers to trade. This can be both beneficial and harmful for regional food producers. And at last this can be about consumer policy and food safety regulations, which also is important for entrepreneurs in the regional food sector.

5.1.4 Few facts on agrifood industry in the Lofoten region

Vestvågøy in Lofoten

On the Lofoten island of Vestvågøy (421 km²), we find the municipality of Vestvågøy, with a total population of more than 10,000. The main road (E10) runs through the whole island, connecting Vestvågøy to neighbouring islands in the east and west. The western road connects Vestvågøy to Bodø by ferry. The Hurtigrute (coastal steamer) arrives twice a day. There are also daily air connections to Bodø. Tall mountains, so characteristic of the Lofoten region, dominate the southwest and north-east parts of the island. In-between, extensive agricultural production takes place in a broad valley, ending in the south at the municipal centre of Leknes. This is one of the largest villages of Vestvågøy, together with Stamsund, Ballstad and Gravdal; all four are situated on the southern coast of the island.

[385] http://www.berkshiregrown.com/html/FAQ.html

Table 1-2 Statistics about Vestvågøy

Population 2004	10 813
0-17 years in population (in percent)	25 %
Employed 16-74 years (population in percent)	66 %
Gross input pr capita (17 years and above)	NOK 201 400
Employment according to industry (in percent):	
Primary industry	13,7 %
Secondary industry	15,5 %
Service industry	70.8 %

Production within agriculture in Vestvågøy

The size of the agricultural area in Vestvågøy is just above 157 km2, this means that 37 % of the area is connected to framing. 80 percent of the agriculture area lies within 20 km from the main city Leknes. In 1959 it was recorded 1 544 agricultural holdings in work. This was reduced to 373 in 1989 and further reduced to 225 in1999 and 199 in 2002.

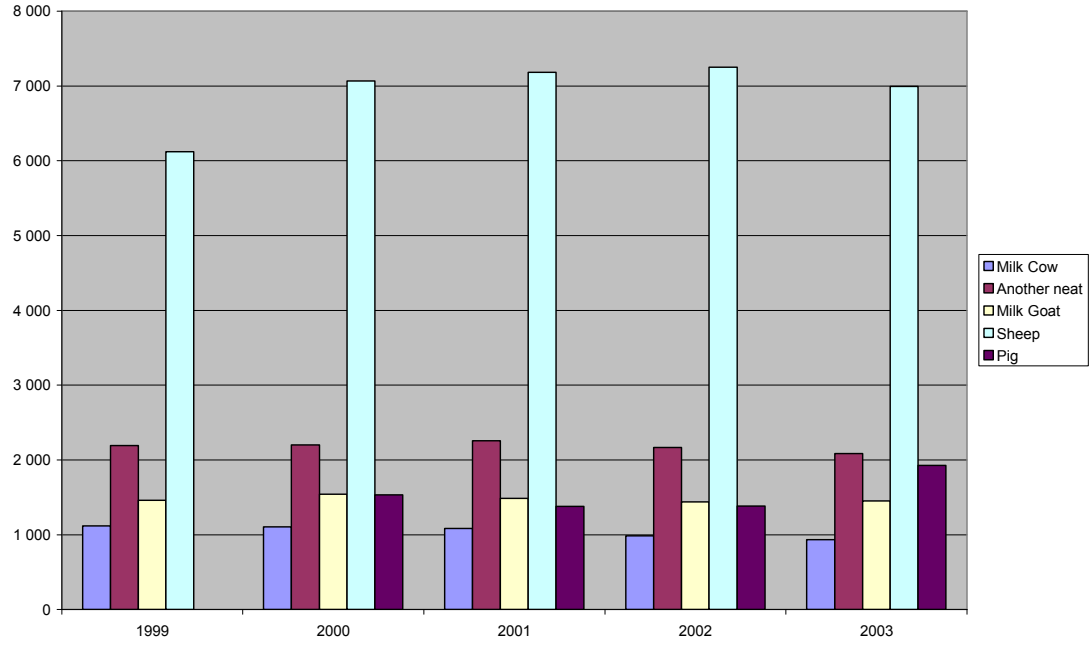
In 2003 there were approximately 230 man year directly connected to farming in Vestvågøy and about 299 – 460 people are dependent on agriculture as an source of income.

The most important activity in the agriculture sector in Vestvågøy[386] is milk production (5 579 511 litre), goat milk production (604 800 litre) and meat production (neat 271 400 kilos and lamb/ sheep 171 800 kilos).

As figure 1-1 shows the number of milk cows is decreasing, while number of milk goats is relative stable. A relative active purchase of milk quotas is one the reasons for the stability in the number of goats. Number of Pigs is decreasing, while the number of sheep's has totally had an increase over the last five years, but a downturn from 2002 to 2003. Number of slaughtered animals is also decreasing.

[386]The numbers are from 2002.

Figure 1-1 Number of animals in the agricultural production in Vestvågøy.



Milk production

Measured in milk production Vestvågøy is the 6 biggest agriculture municipalities in Northern Norway. From 1959 until 1969 number milk cows went down with 43 % from 3 298 to 1878, while the milk production only decreased with 11 %. There reduction in milk cows continued all the way to 1979. From that year both the number of milk cows and the milk production increased. Due to overproduction number of milk cows was reduced with 185 animals from 1999 to 2001(For details see appendix).

The number of farms with over 15 animals are increasing, but still is has over 30 % of the farms less than 10 animals and over 55 % has less than 15 animals.

From 1999 to 2001 16 milk farms were closed down, and most of them were farms with number of milk cows between 10-14 animals (For details see appendix).

Goat milk production

In 1969 there were 135 farms with coats and in 2001 this was reduced to only 18 farms. This tendency has now stooped and the number of milk goats is increasing. Because of relatively small changes in the amount produced per animal, the amount of litre milk delivered per animal are the same as number of animals. (For details see appendix)

In 1983 the quota regulations introduced to adjust the milk production to the marketing possibilities. Every farm have specific quota of milk they can produce every year. In 1997 there was induced an arrangement were the State buy up quotas to reduce the production and some of these quotas are again sold to active farmers as part of the structure rationalisation.

Meat production

In connection with the milk production many farmers produce neat meat. There are 8 farms that have specialised in meat production and the interest for neat is increasing. Counselling regarding meat production is to a large degree done by TINE, Lofoten Agricultural Extension

Service and the slaughterhouses. The production of young goat meat is little and can be characterised as small scale production. The farmers are looking at other breed to see if they can use this to increase the production. There is also pig production in the region and in 2003 there were registered 7 farmers producing pig meat and 3 farms with breeding pigs.

5.1.5 Tourism

According to the World Trade Organisation (WTO) *international tourism* declined by 1.2 % from 2002 to 2003, measured with the indicator international tourist arrivals. This is the largest annual decline ever, caused by the conflict in Iraq, SARS and a weak global economy. Europe's development in terms of international tourist arrivals was more positive with an increase of 0.4 % in 2003.

Statistics of accommodation in hotels, camping sites and other types of accommodation give the best indication on tourism in Norway when the focus is on recreational services. Norway experienced a decline of 3 % from 2002 to 2003 in commercial accommodation. About 2/3 of this commercial accommodation is consumed by domestic customers, and the remaining 1/3 is foreign customers. The latter category showed a stronger decline than the former from 2002 to 2003.

However, within the overall 3 % decline in accommodation in Norway between 2002 and 2003, there is an increase in the accommodation figures during the winter (January-April). It increased by 2 % from 2002 to 2003.

5.1.6 Few facts on rural tourism in Norway

Norway is a country in which tourism is above all focused around nature and therefore the rural dimension of the country. The official marketing channel www.visitnorway.com makes this prelude when it attempts to explain and convince tourists that this should be the destination of their choice:

Why Norway?

Imagine a country where nature is a majestic gift to mankind. Imagine a country enjoying the abundance of nature. Accumulated through thousands of years. You will discover a country, which is enchantingly unique. Natural. Imagine a country where light and darkness intertwine. Where seasons melt together in colours and crystals. Imagine a country where the thawing snow gives way to blossom. Where sea and mountain unite. Discover a country where nature creates art. Where you are invited to a life-fulfilling experience of diversity.

Friendly, down-to-earth people, unique scenery, summer nights bright as day and delightful snowy winters make Norway a very special country. In summer, there are plenty of attractions and activities to keep you busy - the unspoilt open country of the Sámi people in the north and fjords, salmon fishing and festivals in the south.

Source: www.visitnorway.com The web site is maintained by the national innovation policy actor Innovation Norway. Innovation Norway is a new organisation that took over the tasks of the Norwegian Industrial and Regional Development Fund, the Norwegian Trade Council, the Govt. Consultative Office for Inventors and the Norwegian Tourist Board on 1 January 2004.

Hence, it is activities and recreation in relation to the scenic beauty and wilderness of the nature that is emphasised when Norway as product is described. It is the rural dimension of Norway that is central. In terms of concrete "products and services" for the tourists this includes leisure activities in the range from "sight-seeing" and "just staying there and enjoying" to extreme mountain climbing, off-piste alpine and telemark skiing as well as river and sea rafting, just to make some examples. From the side of the supplier rural tourism in Norway is either focused on recreation, cultural adventure and scenic beauty, or it is focused on extreme adventure and performance, of course this also within the context of the same scenic beauty. Within this product range from recreation as human physical (and mental) relaxation to recreation as human physical peak performance, regions across the country have put different emphasis on the products that tourists are offered. This is mainly a marketing issue, even though some regions may be more suited for some activities rather than other. (you do not do extreme mountain climbing in Denmark)

Food traditions

Bright summers and clean nature. Great mountain expanses, a long coastline and changing seasons. The magnificent nature is the source of the outstanding flavour of Norwegian raw ingredients.

Source: www.visitnorway.com

The focus on (local or national) food as part of the total tourist product of Norway varies from region to region or even from place to place. Generally and historically the food focus has been neglected, either as the result of general ignorance or at the expense of the focus on global food chains.

The structure of the tourist industry is strongly dominated by extremely small firms. When it comes to accommodation hotels represent the typical largre firms, they are not even large firms but typically SMEs, but hotels are of course dwarfed in terms of number of firms compared to typically family owned and driven camping sites, cottages, rooms, and other types of accommodation. The structure of mainly small firms and a few SMEs is present on most types of suppliers of tourist products, from suppliers of food to suppliers of sightseeing and activities.

In Norway as a whole there are two seasons, summer and winter. The winter season is mainly related to skiing and is therefore rather distinctly limited to the destinations that offer this. The summer season is of course the peak period. After all summer is the time when most people may become tourists. The summer season includes the total product range we have mentioned, of course except for skiing and activities that depend on winter conditions.

Rural tourism is certainly important for Norway. By means of accommodation statistics it is possible to establish a rough indication of the significance of rural tourism, compared to urban tourism and in the Norwegian national economy. If we look at hotel accommodation, which is the type of accommodation that one mainly finds in urban areas, Norway had about 16 mill. hotel overnight stops in 2002. In comparison the number of night stops in camping sites was just above 7 mill. So it seems that hotel rooms as urban accommodation is twice as important as more typical rural accommodation. However, around half of the hotel accommodation is business related. It brings the number of tourist related overnight stops in hotels to around the same number as overnight stops in camping sites. All together the hotels in the most urban

areas, which include the 3-4 largest towns in Norway, had around 2,5 mill. hotel nights related to leisure in 2002. The remaining 2/3 of leisure hotel nights (ca. 5 mill.) are located in more rural areas. This means that tourists mainly stay in hotels outside the urban areas. Moreover, as much as 90% of the overnight stops in camping sites and cottages are outside urban areas.

If we look at number of firms, employment and turnover in the hotel and restaurant industry, the counties with the 4-5 largest urban areas in Norway account for around 4000 of the 10600 firms, they account for 50% of the around 86 000 employees, and they account for about 50% of the total turnover in the hotel and restaurant industry in 2000. It seems that rural areas are as significant as urban areas in terms of tourism, if we use these rough estimates.

Innovation Norway is the name of the national institutional agency that is responsible for tourism in Norway. Innovation Norway is a new organisation that took over the tasks of the Norwegian Industrial and Regional Development Fund, the Norwegian Trade Council, the Govt. Consultative Office for Inventors and the Norwegian Tourist Board on 1 January 2004. Over the last couple of years Innovation Norway has worked together with the Norwegian tourist industry to establish Norway as brand image and implement a related strategy of Norway as a tourist destination. Three types of tourists are identified, all in close proximity to Norway's culture and nature: 1. "Those who want to be tourists within the conditions of Norwegian culture and nature"; 2. "Those who want to participate in active adventures in nature"; and 3. "Those who want rest and recharge from nature". Through this process Norway is branded as destination for international tourists as well as Norwegians as tourists in their own country. This national marketing effort includes the establishment and maintenance of contact with all stakeholders and interest groups relevant for Norwegian tourism. At the international level this implies in particular collaboration and a marketing strategy towards the national tourist industry and international tourist operators and transporters. At the national level it implies collaboration with regional and local authorities, and of course with national, regional and local tourist operators and suppliers. Innovation Norway has through its established regional network of offices a great opportunity to combine local and regional competence with the national marketing effort.

5.1.7 Few facts on rural tourism in Lofoten

As one of the most well-known and profiled tourist destinations in Norway, the product Lofoten is easy to identify. A quick search on the Internet leads us to a number of web sites that present Lofoten as destination and region and the range of possibilities a tourist have if she wants to go there. Tourism in Lofoten is a major industry and has increased in importance. Public and private services as well as commercial and cultural activities are well-developed. There exists no total number of visitors per year due to lack of statistics. The indicator overnight stays in different accommodations counts between 200 000 and 300 000.

There is very little available statistics about the tourist industry that is limited only to the region of Lofoten. The reason is that the region consists of six municipalities within the larger county Nordland.

Short season

One of the most distinct features of tourism in Lofoten is the short season. Peaking in June, July and August, the short season has significant implications for the behaviour of firms in the

tourist industry. The short season represents one of the most severe challenges to development and innovation. The strategy of extending the season is a repeated theme for firms, entrepreneurs, policy makers, supporting agents and the whole community.

5.1.8 Manufacturing of aquaculture technology

The case is the supply industries of salmon production

The technology of aquaculture largely emerged through the exploitation of well known technologies from herring fisheries, the application of nets to lock op large amounts of herring and store them alive in the fjords for later harvesting. During the 1970s, this technology was successfully combined with the old knowledge of how to breed salmon for cultivation in rivers and on-shore lakes, as artificially bred salmon was put into the sea nets of the herring industry. The initial discoveries were done further south, on the Norwegian west coast. However, this was followed up during the 1980 in Northern Norway, and the county of Nordland is now one of the major exporters of artificially bred salmon. This Norwegian success story developed - during the 1980s technology policy – a full blown national innovation system, including a highly diversified set of sophisticated science driven supply industries, supporting the practical skills and tacit forms of coastal knowledge involved in handling fish as domesticated animals.

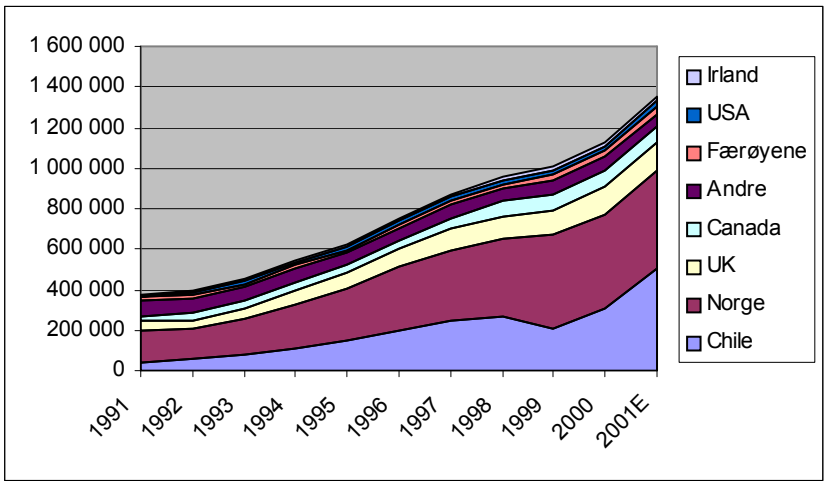
As Norwegian salmon producers increasingly focus on efficient processes, their supply industries do the innovations for them. These supply industries evolved as a result of the development of a strong national sector system of innovation. The reason for this growth was a formidable period of two decades, broadly speaking from 1970 to 1992, when Norwegian salmon production enjoyed a high global price level. As a rule of thumb, if everything went well, and no disasters, like disease, or others forms of damage, took place, production costs were one third of the export price.

The Norwegian production grew rapidly, and the industry evolved through solving formidable problems by expensive learning through full-scale trial and error. During the 1980s, the national innovation system of salmon production developed.

5.1.9 Few facts on aquaculture technology manufacturing in Norway

Norway has had a leading global position in aquaculture of salmon for several decades. For many years, growth in global production was driven by Norway. The turning point was 1999. The Norwegian share of the global salmon market in 1995 was 55%, 2001 it was down to 45%. The total production of salmon in the world 2001 was 1.1 million tons. Today, Norway still is the leading producer, but other countries, copying Norwegian technology, are successfully catching up.

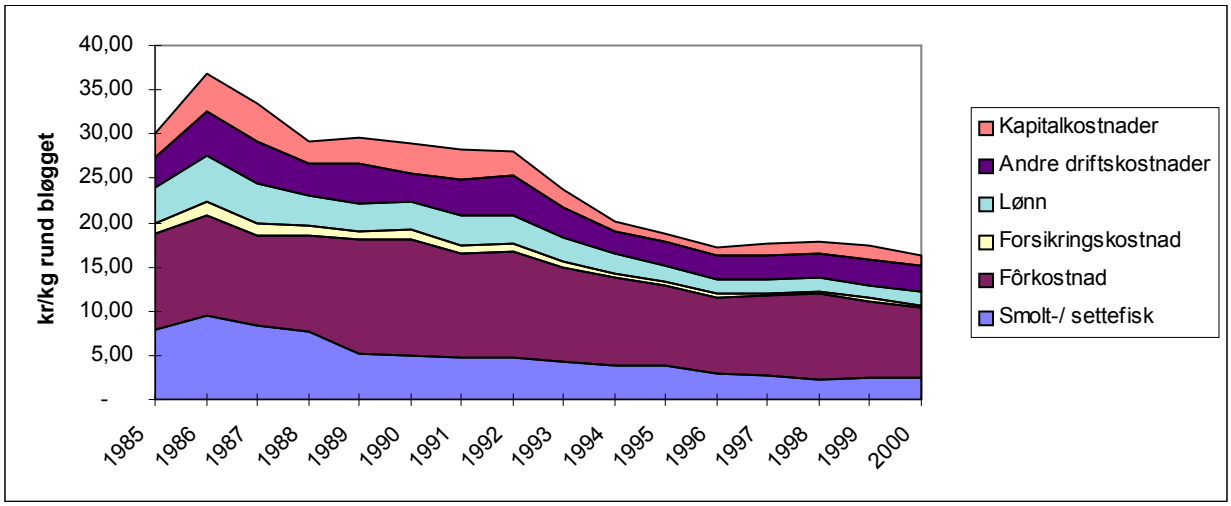
Figure 1-1 The global salmon market 1991-2001, Mill. tons



Source: Kontali Analyse AS

Increasing competition is accompanied by falling prices. Prices have dropped from around 35 NOK/ Kg in 1988 to far below 20 NOK/Kg. This is a serious challenge to all parts of the industry, which is speeding up the pressure for innovation.

Figure 1-3 Average production costs for salmon in Norway, 1985-2000



Kilde: Fiskeridirektoratet

From 1992 to 1996, under the conditions of falling global prices, innovations became crucial to increase efficiency. The competitiveness to the major countries, especially Chile, has increased, in particular because Chile successfully is copying Norwegian solutions, which are easily accessible through the open Norwegian innovation system. In this situation, boosting the performance of the supply industry became a crucial concern for the salmon producers.

The supply industry consists of several sectors:

- Breeding
- Fry production
- Fodder
- Medicine
- On-shore fish processing technology (fishing industry)
- Off-shore systems of cultivation (cages, boats etc)

The supply industry is today well known as an innovative industry – oriented towards creating new products which may enhance the efficiency of their customers, the producers of domesticated fish. Another strategy was the development of new products. One of these new products was cod.

5.1.10 Few facts on aquaculture technology manufacturing in Lofoten

What used to be an activity characterized by several small regionally oriented firms, often serving regional or local markets, the supply industry is today serving a national and international market. The sector is highly diversified, with firms which increasingly become more and more specialized within their core product area. Within the product area, they tend to maintain a comprehensive and diversified spectre of products. In the planning of the ISP project, we expected to find local or regional firms in the Lofoten region. However, it turned out that there was only one proper supply industry firm in Lofoten, Lofilab. Lofilab, accordingly, became the main object of study. Lofilab is specializing in cod fry production, and it has succeeded in becoming one of the major suppliers of cod fry to the emerging Norwegian cod cultivation industry. To complement the Lofilab case, we included two of the supply industries which are found close to the Lofoten region: Melbu Systems Ltd in Melbu, north of Lofoten, and Helgeland Plast Ltd in Mo, south of Lofoten.

5.2 Selected issues in policy and institutional initiatives

5.2.1 National innovation policy, regional policy and rural development policy

Through a central level policy coordination process between September 2001 (the Sem founding declaration of the Bondevik II Government) and February 10th 2004 (The Government Conference on innovation policy), Norwegian innovation policy was transformed from a marginalized activity for a small groups of experts, policy-makers and implementers within certain sectors, like regional policy, industrial policy, and R&D policy, into a main-stream policy context for industrial and regional policy. In addition, innovation policy has impacts within other policy sectors, such as R&D policies, rural policies, and transportation. Innovation policy has a high-profile central government attention.

One of the perhaps somewhat surprising aspects of this rapid diffusion and up-grading of innovation policy is what may be called a *convergence* or *integration* of innovation policy, regional policy and industrial policy *at the level of policy objectives*. This integration was possible through a radical, new *definition* of innovation policy. At the same time, it implied a partial dis-embedding from the point of departure, R&D policy. This redefinition was an achievement of the government itself.

Norwegian national innovation policy, as presented by the Prime Minister in his speech on the 10th of February 2004 has a focus on bottoms up, local and regional development and spatial *distribution*, to the extent that one might speak of *integration* of innovation policy *into* the over-all *context* of *regional and industrial policy*.

The implementation of these over all policies moves in the direction of a regionalization of the innovation policy system. A core element in this regionalization is a re-contextualization and restructuring of central level *policy agencies* of the three core ministries (The Norwegian Research Council (NFR), which is a core agency of the Ministry of Education and Research, and SND, the agency of regional and industrial policy, which now is reorganized and called Innovation Norway.

The reorganization and renaming of these agencies are the link from the central level into the operative end of the new chain of regional and innovation policy implementation and action, which are *regional development partnerships, development coalitions, industrial actors and entrepreneurs*. Through budgetary changes, the institution responsible for regional development partnerships, the "fylkeskommune" or County Council has a greater responsibility, and is now defined as an important actor in the implementation of the Norwegian *national* innovation policy, along with the local "commune" (municipal) institution.

This process must be seen in context with the over-all economic policies in Norway, and the lack of integration between innovation policy and economic policy. Norwegian economic and financial policies under the current government are aiming at enhancing global competitiveness for Norwegian industries through reducing costs. Important measures in this respect are reduced public spending, enabling tax reductions. For these reasons, money allocated to innovation policy instruments has been cut – at the same time as innovation has a higher policy profile. The solution to this contradiction is an emphasis on cost efficient innovation policies, which are found in linking up innovation and regional policy instruments.

Within the over-all framework of Norwegian innovation policy, there still is a place for development of research and technology driven innovation systems serving the core national clusters. However, the major thrust today seems to be in the direction of short-term job creation, rather than handling the strategic challenges facing the *national innovation system*, such as the need for science driven new path creation.

At the same time, the conflict of objectives of Norwegian regional and industrial policy, between on one hand growth (regional development) - on the other hand spatial distribution and cohesion "all across the country", has now been imported into the core of innovation policy, which now emerge as the opposite mirror image of the Finnish second generation technology policy driven innovation policy of the 1990s, which was focusing on technology driven growth in larger cities.

Finding an appropriate *combination* of the two objectives of Norwegian national innovation policy - enhanced long term global competitiveness of the Norwegian economy - and spatial distribution - now seem to be a core question. This combination must be found in the agencies of R&D and industrial policy which are now redefined and redesigned into tools for innovation policy. These tools are now intimately being linked into local and regional partnerships.

Are regional partnerships able to co-ordinate measures? In the regional level partnerships, the vertical coordination mechanisms of the agencies, motivated by their complex internal inter-sector governance systems, has lead to a "hollowing out" of regional development strategies and programs. A frequent criticism of these programs in the past has been that they are just rhetorical maneuvers, where the regional offices of various agencies are informing each other about their activities. The current drive towards regionalization of these agencies reflects the ambition to enable more scope for regional level integration into coherent strategies. Successful regional level coordination requires a larger autonomy on the part of the regional operators of central level agencies.

This is achieved through:

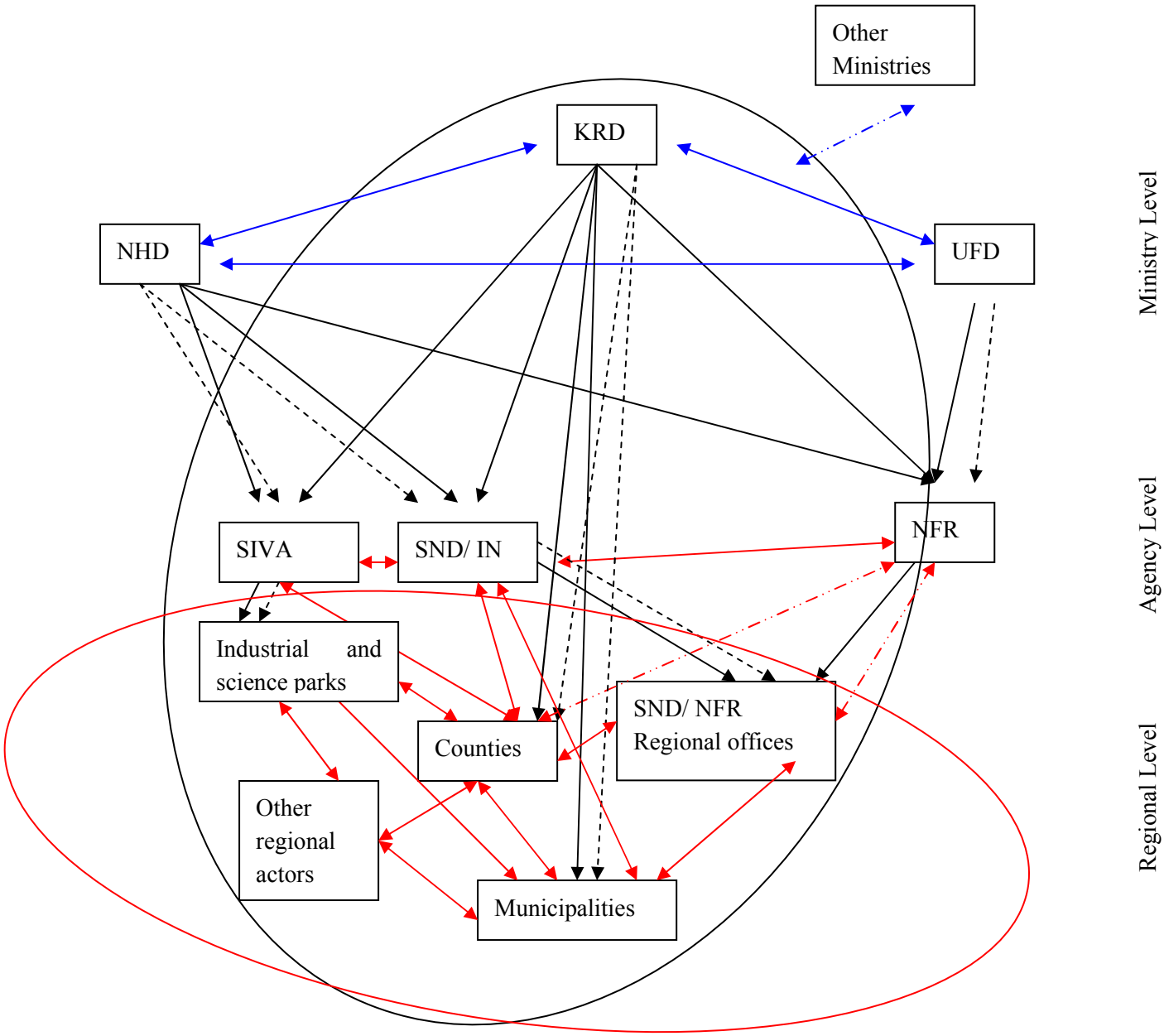
- A push towards regionalization of Innovation Norway, including a transfer of the funding mechanisms of the regional offices to the fylke (County) institution.
- The Norwegian Research Council now also will be present with offices regionally, to participate in the regional partnership strategy development, and to make closer links with local firms and industries.

The new expectations to deliver are directed to the regional level. Here, we find

- Regional development partnerships, their programs and partnership agreements, which includes regional offices of state agencies, the regional fylke (county) democratically elected institutions, as well as representatives of unions, employer organizations, and other actors of civil society.
- Regional development coalitions, who are bottom up networks of small and medium sized firms, as well as local and regional clusters.

Taking into consideration that future policy coherence seems to critically depend upon this level – the interaction and achievements of the agencies and their regional level partnerships clearly deserves attention in the future.

Figure 2-1: Actors involved in implementation of the regional innovation policy, ownership, cooperation and funding.



The figure above maps the main actors involved in implementation of the regional innovation policy, ownership, cooperation and funding.

This chapter should also include mapping of key players in creating policy in this field (who participates?) and key implementation bodies. Also official frameworks for rural business services and innovation facilitations should be described (key service providers, the mandate of these service providers, funding agencies, etc.).

5.2.2 The official framework for business services and innovation facilitation in Lofoten

The Lofoten Council (Lofotrådet) represents the most important overall official framework for innovation facilitation, if we look at the Lofoten region. This strongly consensus-oriented actor deals with sectoral as well as cross-sectoral development issues. Municipality level policy processes complement the collaborative processes in Lofoten. Although the Lofoten Council is present and active, the municipality level is strong and sovereign.

Although the degree of inter-municipal collaboration is high and the vision of this collaboration is to contribute directly and indirectly to industrial development, the assessment of the impact that the collaboration has on real and concrete innovation in firms is difficult. There exist a number of policy documents on the regional and/or municipal level which touch on economic development, entrepreneurship, and/or innovation.

Lofoten is certainly affected by policy frameworks on the national level but not yet on the EU level. Regionally specific policies often link to policies on the national level through the Lofoten Council.

The official framework for rural business services and innovation facilitations (key service providers, the mandate of these service providers, funding agencies, etc.), is also largely organised through initiatives in the Lofoten Council and the municipalities. Within the land based food sector Innovation Norway administers the so called Local Developments Funds (Bygdeutviklingsmidler). In the tourism industry the destination company has the mandate to take care of and coordinate good business services. Destination Lofoten is supported by the municipalities, the Lofoten Council, Innovation Norway, and the majority of the industrial firms.

5.3 Findings from the study of the agrifood industry

This chapter will look at agri-food production in Lofoten, Norway. More specific at Vestvågøy, the largest of the six Lofoten municipalities, in terms of the number of inhabitants and as one of the largest agriculture municipalities in Nordland County as well as in northern Norway. A characteristic of Vestvågøy is despite this their dependence on the fish industry, which is the largest source of income in the region, but there are several reasons why we have looked at agriculture instead.

First of all we had to take into consideration that this is a project including the other Nordic countries and that the analysis should be as comparative as possible. Fishery is natural for some of peripheral areas in the Nordic countries, but not for all of them.

We could have a studied another location than Lofoten, which may had been more representative regarding agriculture sector in the periphery in Norway, but this is a rather small study and it would have required much more resources that are available in this project to do so.

This project is supposed to study how companies relate to innovation, the innovation system they hopefully are a part of and how this effect their daily work. Our main concern in this study have been to locate and study some examples of good practice concerning innovation as well as firms that were not functioning that well and have met barriers connecting with this and Vestvågøy in Lofoten was an ideal place for this.

By choosing the same region for all the Norwegian case studies we have also been able to talk to common support units for the branches all together.

5.3.1 Background information

Number of interviews

In this case study eleven different actors have been interviewed or talked to. Two small scale farms; a traditional farm a slaughter house; a food producer (primarily fish products); a fish company (a new product), an education and consulting company at high school level also representing the Lofoten (Business garden); a consulting firm also representing the Lofoten Science park and owned by a former executive officer at the municipality; a local office of the Norwegian Agricultural Extension Service in Lofoten, an interest group for the farmers in the region. We have also talked to Innovation Norway, a region policy instrument, which promotes nationwide industrial development profitable to both the business economy and Norway's national economy, and helps release the potential of different districts and regions by contributing towards innovation, internationalization and promotion. They have regional offices in all the counties of Norway. We have also talked to representatives from the County Governor and the agriculture department of the Vestvågøy municipality.

We have to differentiate between the primary production at the farms and the actually process of the products they are producing for sale. We haven't asked so much about the primary production so we will for the most leave this part out?

Describing the different actors

Small scale farmers: Ecological goat milk and cheese production in Vestvågøy[387]

Aaland Gård and De tre bukkene

Lofoten has a long tradition for goat keeping, in February 2003 there where 17 farms with approximately 1 500 animals in Lofoten. Two of these farms are certified for producing organic milk and food products. They approximately produces 90 000 liters of milk and possible cheese production is about 4-8 ton. The total quota of milk produced in the region is about 680 000 liters, which has a potential to be refined into 70 to 140 ton cheese. The goat milk that is not used dairy production is sent to Balsfjord in Troms. The ecological milk is there mixed with regular goat milk.

It is difficult to estimate the quantity of goat's cheese sold in Lofoten, but approximate sale among retailers is 1200 kilo white goat's cheese, 5500 kilo brown goat's cheese. The private sale through farm shops amount to 4000 kilo goat's cheese. This is nearly 450 gram per inhabitant.

The producers with private cheese factories consider there to be a potential for much higher sales in Lofoten and their plan to increase their production. The goat's cheese has a rather sharp taste and former surveys showed that this kind of taste is not in line with the general consumer's preferences for mild cheese. The local producers disagreed with this opinion and on the contrary argued that the different flavor additives are well liked.

These farmers are also producing some young goat meat, vegetables and herbs.

Characteristics of the small scale firms

These smaller firms have some kind of special resources on which they base their differentiation from larger firms, but they lack certain resources for competitive advantage especially at the cost advantage side and the marketing side. On the other side they have distinct dynamic capabilities in that the owner-founder-manager-operator is the same person and gives easy links between vision and experimentation. This also gives fewer organizational bindings to who do what and openness for learning from radical new sources.

This family driven companies is typical a small scale food producers within meat or dairy products for a niche market. The knowledge base is to a large extent based on practical experience embodied in specific persons, but these persons also have a background as agronomist which gives them an opportunity to keep up with the science development in agriculture. These persons focus at most at the product and production processes and are not specialists in business management and administration.

Usually the small scale firms have little cooperation and relations beyond the input from suppliers of raw material. They are also rarely in contact with suppliers of machinery and other equipment. The relation with the customers is very important and this can be through agreements with wholesale dealer or direct sale to special distributors like delicatessen shops. This last type of relation is often looser than the first one. This was also the case for the small

[387] This section is based on Årseth, L.M (2003): '*Market opportunities for ecological goat milk production in Lofoten'* Report nr. 26/2003 Nordlandsforskning. ENTREPRENEURSHIP IN REGIONAL FOOD PRODUCTION. Proceeding of 2nd Nordic Workshop on Entrepreneurship in Regional Food Production, Bodø, May 5-6 2003 and interviews with the farmers.

scale firms we talk to, but they were engaged on different arenas like Food from the Farm (Norsk Gardsmat), Norwegian Farm Cheese (Norsk Gardsost), ecological networks and Lofoten Agricultural Extension Service (Lofotringen).

They have informal networks with other firms in the same position and at the same level. These networks are often personal relations. These informal relations are also far the most important channels concerning the accumulation of knowledge and knowledge spillovers, besides the knowledge created from their own trial and error. Other important information and knowledge providers are competitors and especially the large companies in the sector, Tine and trade organization when it comes to making cheese. The most important guidance is still the customers.

The flow of information and knowledge when it comes to practical sides of the productions these are rather open, but when it comes to the provider of more systematic and advanced scientific knowledge. The connection is more limited, but can contribute to overcome barriers, i.e. through confidence in a larger production or be inspired to think new. The lack of these kind of connections also result in that the production and processes are maintained internally and not in cooperation with others or in common project with its own budget.

The biggest challenge for these small scale firms are to capacity with such a few employed people and with scarce budgets. This gives limited resources for other activities. Development and innovation is often depended on that the entrepreneur or 'family' radically changes their attitude towards innovation. To gain a certain volume and stability in the production can be incredibly difficult. A typical argumentation for not industrialize the production is related to the products quality, genuineness and that these sorts of firm don't do this for the money, but that it is a lifestyle for them and that the most important for them is to upheld this.

A private slaughterhouse

Horns Slaughterhouse is a private and family based company. It's a traditional slaughterhouse and the only one north of Steinkjer, Trondheim. In Norway there has been a tradition for agricultural co-operative. Gilde is the biggest slaughterhouse in Norway and has nearly monopoly on slaughtering all over Norway.

Horns turnover inn 2003 was 83 millions NOK. The total slaughtering in 2003 was 1 776 tons, an increase at 206 tons from 2002. 12-14 permanent employed people. In the slaughter season (autumn) they are around 40 employed. This is for the most fishermen.

The main activities is slaughter production, with some food production for the consume market (very traditional products). The company was very interested in refining the meat themselves and they thought this was a way to go for the company.

The most significant suppliers are local farmers.

Locality	Animal	Amount NOK
Vestvågøy	pig and sheep	2 511 000
Steigen	pig	2 441 000
Steigen	pig and neat	2 332 000
Sortland	pig and neat	1 722 000
Andøy	pig and neat	1 593 000
Vestvågøy	pig and neat	1 483 000
Harstad	pig and sheep	1 323 000
Harstad	pig	1 072 000
Harstad	pig	1 027 000
Vestvågøy	neat and sheep	905 000
Steigen	pig and neat	893 000
Steigen	neat	806 000
Vestvågøy	neat	759 000
Steigen	neat	749 000
Harstad	pig and sheep	720 000

The firm's most significant client and nearly the only one is Fatland, a food producer in Oslo.

Lofoten Products – Marine food production and market and sales company

Lofoten Products was established in 1994 and has become a high quality food producer of Lofoten delicacies. After having re-established the business and several bankruptcies and relocations, the company has now an annual turnover of approximately 53 million NOK. There are 29 people employed at their offices at Leknes, of whom 22 are within production.

Although the company mainly produces fish products, they are also distributing land based food products from Lofoten like, rack of lamb ribs (Norwegian specialty, esp. at Christmas) and cured leg of mutton (fenalår), both from LofotLam. For the moment Lofoten Products are not willing to distribute more agro-food products, but they can in time maybe one of several possibilities for building up a marketing and sales company for the whole food sector in the region.

Lofotskrei

Lofotskrei is a fish company that is refining the stockfish by soften the fish in water after the drying process. They are cutting out the filets and selling it to hotels and restaurants where it is grilled or roasted. This whole new product is one of the most expensive dishes you can by in Lofoten at the moment and is a very interesting case in the branding of food products in Lofoten[388].

Opus

OPUS-Lofoten is Nordland fish vocational school and resource centre and is a related to the county. Opus-Lofoten offer skills upgrading in a wide spectre of subjects, targeting at the business sector, municipalities, schools etc. For example they have vocational training in

[388] See http://www.lofotskrei.no/

cooking, which has an important role when it comes to developing new products. OPUS-Lofoten is an important actor when it comes to upgrading the skills within the region.

Bjørn Kjensli and Poseidon Consulting AS

Bjørn Kjensli is a former executive officer at the municipality in Vestvågøy and has a very good knowledge about the region. He is now working in Poseidon Consulting AS, as a managing director and is engaged in the Lofoten Business Park. He is also organizing an innovation conference in Lofoten this fall, including the agriculture sector as well.

The Norwegian Agricultural Extension Service (Landbrukets Forsøksringer (LFR))

The Norwegian Agricultural Extension Service is comprised of 88 extension groups and approx. 29,000 members, and is led by a national steering committee.

Primary tasks

- The primary task of the Agricultural Extension Service (LFR) is giving advice based on local research regarding all kinds of crop production.
- Approximately 250 extension agents and assistants are employed by LFR.
- Financial and technical advisory services are also widely available.

Even though farmland only covers 3% of the Norwegian land area, there are farms in virtually every part of this rugged country. The Norwegian Agricultural Extension Service is thus divided into 97 local extension groups, ensuring that every region is covered by local expertise. Each one of the groups is owned and controlled by its members. All in all, there are about 29, 000 members throughout the entire country.

Each extension group has its own extension agents, thus enabling easy access to advice and counselling. The first extension group in Norway was started in 1937, and since then extension workers have developed expertise in all fields related to applied agronomy. Today, the agricultural Extension Service is Norway's most important system for local research and advisory service in crop production and farm economics.

Anyone running a farm or horticultural business can become a member of the local extension group. An annual membership fee entitles you to a number of different advisory and experimental services.

The main task of the Agricultural Extension Service is to provide updated advisory services to its members, based on the results from local field trials. In this way, knowledge can be generated and spread efficiently. All members, no matter what or where they produce, are encouraged to actively participate in their extension group, thus utilizing the available expertise.

Making use of the extension groups' know-how ensures improved resource utilization, product quality and profitability.

Based on extensive cooperation with agricultural experimental stations, the National Board of Animal Production Recording, agricultural authorities, professional associations, agricultural cooperatives and others, the Agricultural Extension Service can offer:

- Crop production advisory services, based on the conditions and needs of each individual farm.
- Fertilizer management plans and soil sampling.
- Improvement of product quality and farm economy.

- Improved utilization of farm resources.
- Advisory service in organic/environmentally sound agriculture.
- Farm visits, professional seminars, study trips, courses, demonstrations etc.
- Crop-growing manuals, research reports, newsletters for members.

Due to considerable geographical and climatic variations in Norway, choice of crops, fertilizers and cultivation methods can vary a great deal. It is therefore necessary to contact your local extension group in order to obtain advice suitable for the conditions and possibilities of your area.

Besides being a traditional agricultural extension service as described over, the local division in Lofoten is looking on how one should prepare the production and how to organise farming so they all together can brand the products outside the region. Lofoten Agriculture Extension Service (LAES) is heavily involved in the LofotMat project, which is trying to build up a common marketing and sales company for food products produced in Lofoten.

Innovation Norway

Innovation Norway is a regional policy instrument, which promotes nationwide industrial development profitable to both the business economy and Norway's national economy, and helps release the potential of different districts and regions by contributing towards innovation, internationalization and promotion. They have regional offices in all the counties of Norway. Innovation Norway is an agent for the Regional Development Fond (Bygdeutviklingsmidlene) and the Value Creating Program for Food (verdiskapningsprogrammet for mat), which are important programs when it comes to development of agro-food in the periphery.

The County Governor and the municipality

This is a description of the county and municipalities level responsibility, concerning the agri-food sector.

Farming and forestry

The County Governor shall contribute to the implementation of national agriculture policies by information, distribution of state grants to farmers, and through locally adapted measures. The Governor co-operates in several fields with other regional state offices and local government. Encouraging new business based on farming and forestry are important fields of co-operation. The Governor's office acts as secretariat to the County Agricultural Board.

Rural Development

The County Governor manages state grants to development studies and infrastructure in the countryside. The grants are meant to support a profitable development of new jobs, based on farming and forestry.

"Innovation Norway" handles grants to companies. The Governor co-operates with the firm in certain programmes for processing of raw materials from farms and forests.

Agricultural Board

The County Governor shall contribute to the implementation of the national agricultural policy, by managing grants and locally adapted measures. To achieve this, the Governor co-operates with other regional state bodies, the county municipality and the municipalities.

Development of new, farm-related industries is a top priority. The Governor's office is secretariat of the County Agricultural Board.

Soil and plant cultivation

The County Governor acts as a consultant, advising farmers on the wide range of regulations in modern farming. Supervision is part of the job. The Governor plays a vital role in the development of ecological farming, and manages the funds for transition and grants for the sustainable use of land.

Soil and plant cultivation

The County Governor acts as a consultant, advising farmers on the wide range of regulations in modern farming. Supervision is part of the job. The Governor plays a vital role in the development of ecological farming, and manages the funds for transition and grants for the sustainable use of land.

Animal husbandry

The County Governor advises farmers on topics like state grants, regulations, compensation arrangements (in case of ordered slaughtering of animals), radioactivity, organised grazing co-operation and the conflict over predators. The organised grazing arrangements aim at a sustainable use of grazing land in the mountains and other uncultivated areas, and reduce the loss of animals to predators, accidents and illness. The Norwegian Animal Health Authority

Grants

The County Governor manages a long range of state grants to farming and forestry. Most important to farmers are the production grant and the relief grant. The production grant includes a wide range of measures. In forestry, grants are aimed at long-term investments like forestry planning, reforestation, silviculture and forest roads. The County Governor handles grants to forest roads, thinning and forestry in rugged terrain. Most grants are channelled through the municipalities, who are obliged to inform farmers about them receive applications and decide on them. Applications for production grants are filed twice a year. The Governor assists the Norwegian Agricultural Authority (SLF) by control measures and statistics, and treats complaints from farmers about municipal decisions.

Ecological agriculture

Farmers making ecological produce follow special regulations for soil and livestock, and are subject to annual control on the farm. Ten per cent of the arable land in Norway should be cultivated in accordance with ecological standards by 2010. That is a national priority. The County Governor is responsible for the making and implementation of county plans for ecological agriculture, and distributes funds to projects. The County Governor is open to widespread co-operation with various interests to achieve the national goals.

5.3.2 Knowledge and competence base

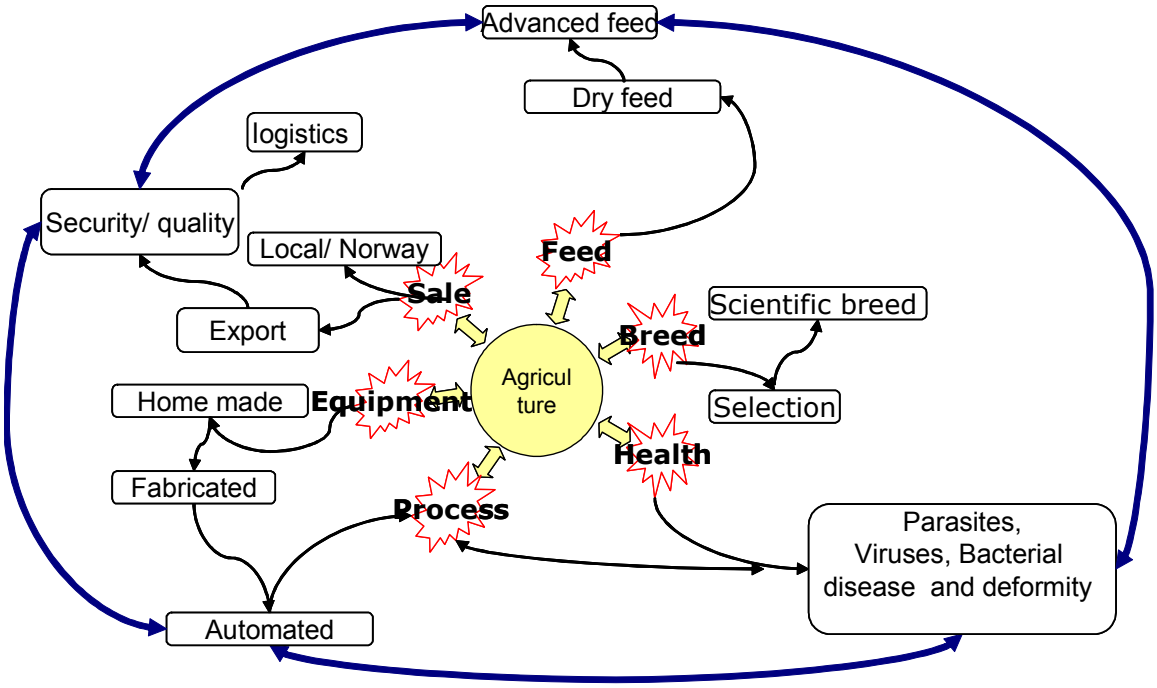
The firms we have looked at have different needs when it comes to utilize knowledge, competence and skills. We have fore the most looked at small scale firms, which have limited degree of industrial activity, depended on experience based knowledge, skills and craftsmanship, synthetic knowledge. This knowledge and skills is deeply rooted in cultural

and social traditions. Some of the firms can be characterized as larger firms, which to some extent has a division of labor and more professionalism when it comes to knowledge.

Overall the people in the agri-food sector in Lofoten, has little formal education besides high school and vocational subjects, some of them have higher education, but there are no such educational establishment in the region. The Norwegian education and research system for this sector is located in the central part of Norway, Oslo and Akershus, which is a problem since the local agro-food production to a larger degree, are dependent on high competence.

The firms in this case study uses for the most product- and process specific knowledge generated outside the formal education system and are more based on practical knowledge, generated through trial and error, copying and, purchase of machines and equipment which is often referred to as synthetic knowledge base. Besides this we see that the agriculture sectors among many other sectors make use of a more analytical knowledge base, which is related more to a science and R&D based knowledge.

Figure 3-1: From practical to much more science based knowledge in agri-food, new knowledge fronts?



There is no such science and R&D based knowledge actors in the region and the firms we have talked to have rarely contact with such institutions. The agri-food firms in Lofoten show a very good knowledge about processing, but many of them can be stagnant due to low volume. They have often too little marked related knowledge. The firms are dependent on local knowledge and are not systematically connected to other knowledge providers and large scale actors in the innovation system and this is partly due to the lack of a more theoretical knowledge base. They are in a large degree dependent on suppliers, customers or Lofoten agriculture extension service ability to 'translate' this kind of knowledge. The firms also have to be more open for learning from radical new sources.

There were also mentioned that the mismatch between the competence in the firms and the public sector was one hinder for development and innovation in the region. The private and the public sector do not communicate very well, which causes a lot of frustration and misunderstandings. This lack of communication has also led to that the local firms to a lager degree are listening to organizations or milieus that are not located in the region. This have the consequence that some of the competence the firms need not are in the region, but are coming with equipment imported from outside the region and are not locally developed.

There is a need for quality control and better access to systems for testing and tasting. A general lack of resources and control makes the firms vulnerable for external events and they do not manage to control the value chain especially when it comes to the market.

To increase overall performance, firms must improve their competence and knowledge in industrial production, marketing, business management, partnership with large scale actors and strategic entrepreneurship.

5.3.3 Innovation activity

In the land based food industry, the industrial actors work with innovation by focusing on niche products and the value of Lofoten as highly recognized brand. In the land based food industry standardised products and large scale production suffer from lack of critical mass. The tendency is that processing is moved out of the region. There are only one private slaughterhouse left in the region and Tine

Too many (small scale processing) firms are surviving due to owner's acceptance of 'working for nothing' and no investments pay off. Innovation and development activity is to large degree an integrated part of the daily work, so most of the firms are working deliberately with development, improvements and innovation. This is both product and process innovations, but is for the most incremental innovations and not radical innovations.

There are several reasons why the firms innovate, but this is often related to a new variant of a product or that they have received new equipment from a supplier. The generators and drivers for innovation come from different actors, but most frequently from customers, internal personnel, suppliers or competitors. Despite that the firms innovate, our impression is that the turnovers come for the most from unchanged products.

When it comes to bottlenecks for innovation, the firms (especially small scale) report that this is due to lack of resources, low production volume and they are not professional enough. This can partly be explained by the size of their activity and that there is a need for larger investments to increase volume, turnover and number of employed to generate more experiences and innovation opportunities inn connection with the daily work

The region has strong traditions and an individual form for production structure, which result in a relatively strong resistance towards reconditioning and innovation. Collective agreements like for instance a common branding company must be put into consideration instead of individual performances at the market places.

5.3.4 Cooperation and networks

Agriculture in Norway is an individual industry and at the same time often consists of small firms where the owner-founder-manager-operator is the same person. This gives easy links

between vision and experimentation, but fewer organizational relations and bindings to who-do-what and openness for learning from radical new sources. So not surprisingly, customers and suppliers are the most important cooperation partners for the firms, locally, regionally and nationally in connection with innovation.

The value chain in the agri-food sector in Lofoten, as well as in Norway is to a large degree characterized by close relations between the producer and industry, since the cooperation is owned by the primary producers. There are great many actors involved in both upstream and downstream activities, but there is no uniform structure of the value chain in this sector. It varies between the different products and the size of the firms. Despite this, several of the same companies are both involved in upstream as well as downstream activities in the same production groups, but this is usually larger firms.

The small scale firms have on their side little cooperation and relations beyond the input from suppliers of raw material. They are also rarely in contact with suppliers of machinery and other equipment. The relation with the customers is very important and this can be through agreements with wholesale dealer or direct sale to special distributors like delicatessen shops. This last type of relation is often looser than the first one.

Some of the firms have informal networks with other firms in the same position and at the same level. These networks are often personal relations. These informal relations are also far the most important channels concerning the accumulation of knowledge and knowledge spillovers, besides the knowledge created from their own trial and error. Other important information and knowledge providers are competitors and especially the large companies in the sector, Tine and trade organizations when it comes to making cheese. The most important guidance is still the customers.

When it comes to flow of information and knowledge about practical sides of the firm's production, the firm's are for the most in contact with branch organizations like Lofoten Agricultural Extension Service (Lofoten Forsøksring) or the agricultural department of the county governor (FMLA[389]). OPUS-Lofoten is also important when it comes to offer the different farms vocational training and skills.

A systematic and advanced scientific knowledge, cooperation and network are though more limited. Such relations can contribute to overcome barriers, i.e. through confidence with larger production units or to be inspired to think new. The large firms like Tine (milk) and Gilde (meat) are willing to cooperate with small niche producers, but they will often do it their way. This results in that such processes are maintained internally and not in cooperation with others.

Contact with regional authorities is conducted via the agricultural department at the county governor's office (FMLA). The County Governor contributes to implementation of national agriculture policies by information, distribution of state grants to farmers, and through locally adapted measures. The Governor co-operates in several fields with other regional state offices and local government. Encouraging new business based on farming are important fields of co-operation.

[389] FMLA is an acronym for the Norwegian name *Fylkesmannens landbruksavdeling,* meaning the agriculture division of the county governor.

The Lofoten Agricultural Extension Service (Lofoten Forsøksring) is the most important system for local research and advisory service in crop production and farm economics. Anyone running a farm or horticultural business can become a member of the local extension group. An annual membership fee entitles you to a number of different advisory and experimental services. Most of the farms are connected to this organisation.

Lofoten food project

Besides being a traditional agricultural extension service the local division in Lofoten, is looking at how the farmers can prepare their production and how to organise farming so that they all together can brand products in and outside the Lofoten region. Lofoten Agriculture Extension Service (LAES) is heavily involved in LofotMat a project which, is trying to build up a common marketing and sales company for food products produced in Lofoten.

This is a project that is working with both agriculture- and fish products. The concentration is on distinctive branded goods and competence building. The idea behind the project is to build up a sales organisation for food products from Lofoten, with common marketing, product demonstrations, campaign sale and direct sale to the customer and marketing surveys.

There is a need for a common branding company, instead of individual performances at the market place as it works today. A problem is that there is a relatively strong resistance towards reconditioning and innovation and it is hard to get the farmers involved and see the need for such a marketing and sales company.

After a long process LAES got economic backing from Innovation Norway and the Value Creation Program and was able to start LofotLam, where LAES have been able to create a kind of sales company, for young goats from Lofoten. Another scenario is to use the already established company, Lofoten Products as a sales and marketing company. The only problem is that they are for the most refining and selling fish products and are not for the moment willing to take on such a role.

A critical point for survival of such a sales and marketing company is the production volume. One way to do this is to start with other and new products form the firm, like milk. The local dairy in Lofoten was shut down for a few years ago and all milk is now sent out of the region. It now takes 7 days from the milk is delivered by the framer until the milk can be bought in the local shops. With a local dairy this will reduced to 15 hours. Tine, the largest producer of milk and dairy products in Norway is most in favour for production of cheese rather than milk even though this is a more complicated process and need more resources and are not what the local farmers wants. This is an example of that the large companies will have it their way.

The connection between local food and tourist production

Lofoten and its natural resources, traditions and culture and specific scenery make up a basis for the tourist product. This is also very important for the food industry. The food products are produced in and are dependent on quiet unique or rare Norwegian climatic conditions and represent important part of the regions image. Lofoten is a famous for its mountainous islands, the rough ocean and the catch of spawning cod in the Lofoten fisheries. The long tradition of exporting stockfish has put Lofoten on the world map, especially in the present most important market, Italy.

The food industry in Lofoten might directly or indirectly make up an important part of the tourist product. They can work as tourist attractions like garden visits and make important part of the cultural landscape, the identity and history of a place. The food industry is also depending on and profit from the tourist industry.

Surprisingly there is a poor cooperation and no formal networks between the agri-food sector and the tourism sector. The tourism is much more related to the fishery sector. There is great potential for such cooperation in Lofoten, especially when they now try to build up a branding company for agriculture products in Lofoten.

5.3.5 Innovation conditions

In Norway, nationally and at a local level the Government has an important role as a driving power by creating economic room for activities where different actors can interact in the development of innovations.

Despite this there has so far been rather little attention to the role of innovation in economic development of traditional and mature industries, like agriculture in rural and peripheral regions and specially the integration of these industries in national systems of innovation.

The Government has recently realized a plan, which sketches some principles that need to be fulfilled in order to implement a horizontal innovation policy, also concerning the agriculture sector[390]. The plan has ambitious objectives for innovation as one of the most important criteria for value creation in Norway also for agri-food production. So far there has not come any concrete out of this for the agriculture sector.

An important actor, which promotes nationwide industrial development profitable to both the business economy and Norway's national economy, and helps release the potential of different districts and regions by contributing towards innovation, internationalization and promotion, is Innovation Norway. They administer the so called Local Developments Funds (Bygdeutviklingsmidler) together with FMLA, which is one the few regional policy instruments arranged for the agriculture sector and innovation. The firms that have received support from the Local Developments Funds are very pleased with this arrangement.

Other firms in this case study emphasize that the Government do not arrange for a good policy concerning innovation and industrial and commercial development. This is connected to public bureaucracy and regulations, which they mean complicate the production and is time consuming in the daily work. They are also not satisfied with the guidance from agricultural department of the county governor (FMLA).

Overall we can say there is lack of local policy attention and local policy help concerning innovation and this is an important observation when we compare the cases in Lofoten. Why is not the most important municipality (Vestvågøy) concerned with innovation in agriculture in the same manner as with tourism for example?

Policy conclusions

Since local government in playing such a crucial role in innovative processes, it should be offered increased opportunities to act with flexibility in such innovation processes. Is there a

[390] 'From idea to value creation' (Fra ide til Verdi), NHD 2003

peripheral innovation system in Lofoten aimed at agriculture and food production? As we see it there is no fully developed local innovation system in this sector in Lofoten. The firms and the supporting actors are too fragmented missing strategic cooperation and networks. The firms are also pretty small and have too few resources, when it comes to education and manpower.

Building up a marketing and sales company with focus at Lofoten as a brand we think is a good idea. This can lead to networks and horizontal cooperation, which can give more control and opportunities for more long term projects. This can also be one of several different arenas where the companies can discuss innovation challenges with the authorities and other actors at different levels.

Besides this the authorities most develop innovation programs, which to a larger degree can help firms with lack of recourses and connect them with the innovation system. There are very few, if any programs directly target on innovation in the agro-food sector.

The Authorities must focus on solutions and be more users oriented and have the ability to adapt to external events. The firm must be secured qualified labour through local and regional embedded institutions.

Surprisingly there is a poor cooperation and not many formal networks between the agri-food sector and the tourism sector. Local food trails can be developed to attract both local customers and visitors. Local food can be used to branding a place, and the products of a special geographic origin are examples of cases where food products have contributed to the marketing of the region. One Example is the Parma ham and the Parma region, this can mayby also be the fact for some products from Lofoten?

The Government has an important role as a driving power by creating economic room for activities where different actors can interact in the development of innovations. It is also important that the firms focus on how they can be more effective on different market arenas.

5.4 Findings from the study of the tourism industry

Summary and introduction

The tourism industry in Lofoten can be described with keywords such as identity and variation, entrepreneurship and individuality, but also collaboration and co-ordination. Within these partly diametrically paradoxical concepts, the concept of development, or innovation, in tourism, is strongly present. This applies to a varying extent the firm level and perhaps in particular the industry and the policy level.

In a historical perspective of 20 years back or so, development is the result of entrepreneurship by actors with local ownership and control as well as by actors with no particular roots in the region, entrepreneurship by investors from outside the region. The policy level is historically involved in development and innovation. Currently there is an overall initiative to plan the further development of Lofoten, and the initiative is above all a collaborative process between the national/regional policy actor Innovation Norway, the 6 municipalities in Lofoten and the dominating regional actor in the industrial domain, which is the destination company "Destination Lofoten". Hence, the local/regional policy level is actively involved in tourism development, based on institutionalized interregional collaboration at the policy level.

Compared to the policy actors' conscious attitude and work with innovation in tourism in Lofoten, the attitude and actions of tourist industry firms concerning innovation and development are more varied. The majority of the large number of small firms offering accommodation may feel that their potential in terms of innovation is small. Many feel that they have offered the same product as long as they can remember, and that their opportunity to innovate is small. Larger firms have stronger financial bases and seem to be more actively involved in innovation. But the complete story about tourism in Lofoten is certainly not as black and white as saying that larger firms innovate and smaller firms do not. When describing innovation and development in this study our perspective is strongly influenced by the fact that tourism as product is difficult to conceptualize. Or to put it more correctly, the definition of the product tourism in Lofoten may be very different, depending on the perspective one takes.

While small family firms offering accommodation are forced to think innovation in a very concrete sense of the term (refurbishing another fisherman's cabin), larger actors and in particular policy actors need to think innovation in tourism in the comprehensive sense of the term. It has to do with investments in transport and public facilities and land and property regulation policy. It has to do with innovation policy and planning and supporting industrial actors and it has to do with product development and marketing effort of the complete adventure of Lofoten. Just to mention some aspects, which are relevant for the product tourism in Lofoten.

We investigate innovation in tourism in Lofoten with the focus on what kind of perspective, competence and knowledge it relies on. Moreover, what are the most important actors and networks involved, and how are these actors' perspectives and competencies contributing to innovation? What is the interplay between different perspectives and types of competence and knowledge and how does it feed into innovation and development of tourism in Lofoten?

5.4.1 Background information

In addition to being based on written material about Lofoten, such as books, reports, policy and marketing documents and other types of material, this study is mainly based on a number of interviews and conversations with actors in the tourist industry in Lofoten. The interviewees mainly fall into two categories. On the one hand we have talked with operators or suppliers of different types of tourist products, typically within accommodation, food, culture, attractions, adventures and leisure activities. On the other hand we have received input from supporting actors of tourism in Lofoten, typically representatives for local authorities, local and regional policy makers, and suppliers of advice and competence related to tourism and development of tourism.

In more detail we have had interviews and conversations with four owners and managers of the most popular and typical accommodation that is offered in Lofoten; Fishermen's cabins (Rorbuer). One of these persons is a profiled entrepreneur that is engaged in an array of projects targeted at developing Lofoten as society and tourist destination. We have had conversations with core representatives of four suppliers of cultural products such as museums and exhibitions. Two of these actors represent very important participants of what we could call the local and regional knowledge infrastructure. We have had conversations with the destination company (Destination Lofoten), which is a core actor at the industry and policy level. At the policy level we have had conversations with a range of persons: representatives for the local authorities in the 6 municipalities of Lofoten and representatives for local, regional and national policy actors.

Key actors and their context

Because of its geographical location Lofoten has what may be called an ideal structure for tourists. Attractions, activity based adventures, different types of places for food and drinks, different types of accommodation – and everything wrapped into a proper, local, picturesque context where the scenery of the nature has a constant impressive character. The structure of the attractions is often very convenient – clusters of several attractions within walking distance, in the compact original sceneries of old, small, exotic fishing villages. The scenery is natural attractive wherever you turn your head. The more attractive places are located in convenient distance from each other – never more than a one hour drive. And as mentioned, nature surpasses your expectations. Therefore, Lofoten is among the destinations that people have set as targets for their holidays. It is what we may call a primary destination in the tourist market. The region has more visitors than most other rural destinations have in Norway.

There is a wide range of accommodation possibilities in Lofoten, from camping sites, to typical rental accommodation such as cabins and Fishermen's cabins, and different types of hostels and hotels. A large share of the supplier firms are small family owned and family driven firms, but during the last couple of years larger national hotel chains have showed interest in Fishermen's cabins, and there are now some examples of more commercial (than family owned) ownership and control over this type of accommodation in Lofoten. Destination Lofoten, which is a commercially driven company that works within operation of and development of tourism in Lofoten. Destination Lofoten receives support from both regional and local authorities and from industrial firms in Lofoten. Destination Lofoten is a special actor that despite its commercial obligation may be seen as a mediator between local/regional authorities and firms.

The people and actors that we have been in touch with represent key actors of the tourist industry in Lofoten. Let us look closer at some of the most important destinations within Lofoten. We take a brief look into the near history of how development and innovation in tourism started in these locations. We do this in order to describe the different types of contexts that the actors live in[391].

Å, Sørvågen and Reine

Å is located outermost in the southwest of Lofoten, where the road ends. And just a few kilometres inside Å are the small communities of Sørvågen and Reine located. The development of tourism in this area started during the second half of the 1980's. There was a crisis in the fisheries and the atmosphere in the small local communities was bad. People did not believe in the future. The conditions for fisheries were getting inappropriate due to low effort of maintenance and no investments in new ports or facilities for receiving fish and modern fishing boats. Several individuals from local families with historically based ownership and control over fishing facilities and ports have been responsible for the development of the tourist industry in Å, Sørvågen and Reine. One of them realized early that he could not take care of maintenance and preservation of the large number of historical buildings related to fisheries, thus he let the municipality have some of the buildings and facilities at its disposal. The same individual, however, saw the business opportunity of providing board and lodging to tourists, thus he refurbished some of the facilities and made a restaurant and fishermen's cabins.

Another individual, who was a teacher, was of the opinion that something had to be done in order to give people back their belief in the future. Together with other culturally interested people he managed to make the building and facilities that the municipality had taken over into a fishing village museum. He also established a travelling/touring/tourism firm that developed its activities into adventures for tourists and training/education of young people within the subject of tourism. We will come back to this actor and his competence and knowledge base as a foundation for development. According to Viken[392], a bit into the 1990's the owner of another fishing facility established a stockfish museum in Å. The establishments we have referred to here took place at a time when the tourist industry in Northern Norway experienced a boom. The entrepreneurs we have presented have in common the property of being culturally interested in development and preservation of the traditions embedded in the fishing villages southwest in Lofoten.

Today the soutwestern part of Lofoten is a well-organized destination with different types of attractions, accommodation and restaurants. The infrastructure provided to tourists includes above all the information office and training/education centre already mentioned, which has its very specific perspective to how tourism and the tourist industry should develop in the future. We will come back to an elaboration of this below.

[391] The information in these paragraphs about some of the main locations in Lofoten is taken from our interviews and combined with information from a chapter about Lofoten called **Turismeutvikling i Lofoten,** in a book edited by Arvid Viken called **Turisme. Tradisjoner og Trender**, Gyldendal Norsk Forlag, 2001.

[392] Op.cit.

Borg – Lofotr

Lofotr – The Viking museum is among the largest investments in tourist attractions in Lofoten the last 10-15 years. Comprehensive archaeological excavation in the 1980's at Borg in Vestvågøy municipality uncovered a chieftain's hall from the Viking age. With help from culturally engaged local inhabitants the municipality realized its administrative responsibility for the significant cultural treasure that was found. A working group consisting of local politicians and bureaucrats, representatives of cultural authorities and the tourist industry, and a representative for Tromsø museum, the largest regional university based museum, made an effort to investigate how one could exploit this culturally rich locality. After a thorough process that included many inputs from abroad and from competent and experienced consultants, the solution was to establish a museum and a modern tourist attraction built around a reconstruction of the chieftain's hall.

Today Lofotr is run as a site museum by a competent staff counting ca. 10 persons that maintain what seems to be a successful combination of business and academia. It consists of a commercial business unit that serves more than 50 000 tourists annually with attractions and activities from the Viking age, together with archaeological projects and activities of a high academic standard. Lofotr has contributed to many spin off activities and spill over effects, including for example an outdoor pursuits centre, a pub, and local suppliers of costumes, food and other products.

Henningsvær

Henningsvær is probably the most popular fishing village in Lofoten. The village has an appropriate port for fishing and tourism, nicely sheltered from rough sea. Making a walk around the port before or after dinner is emphasised as a must for tourists. The port and the cultural landscape is perhaps the main attraction in itself, but from the port there is also immediate access to attractions and activities. The main attraction except from the cultural landscape and locally inspired restaurants and accommodation is the local art gallery containing a local artist's and other artists' paintings. The place has fishermen's cabins as well as hotels to offer. Both local entrepreneurs and investors from outside the region (from South Norway in particular) have engaged in developing accommodation products. As the trend in Lofoten in general, Henningsvær experienced a strong increase of tourists at the end of the 1980's. A local person with experience from tourism regionally made a contribution to a plan for developing Henningsvær. Most present attractions and activities have been established by people with local connections and with special gifts or qualifications. However, many of these local entrepreneurs seem to have been living outside Henningsvær, typically for some years, before entering the tourist industry in the village. This latter point is a concrete observation made by Viken in his book[393].

Kabelvåg

Despite being part of the urban municipality of the largest town in Lofoten, Kabelvåg can still be considered a fishing village with its port, facilities for reception of fish and maintenance of boats and equipment. As in the other fishing villages we have described there are still many fishermen registrated. In place with an active fishing fleet the whole society is of course

[393] Viken A., **Turismeutvikling i Lofoten**, chapter in the book edited by Viken, **Turisme. Tradisjoner og Trender**, Gyldendal Norsk Forlag, 2001.

influenced. Old tree houses give the places traditional identity and atmosphere and this contributes to the fact that Kabelvåg is an attractive spot for tourists. The latest years work has been concentrated on refurbishing some of the cultural landscape from old times. The place has three of the absolute top attractions in Lofoten, a museum with for example discoveries from the Viking age, the Lofot aquarium, and a gallery that is built up around a collection of paintings made and given by Espolin Johnson, one of Lofotens great sons in terms of art. During the last part of the 1980's one of the biggest and most discussed tourist development projects and investments in Lofoten took place in close proximity to these attractions in Kabelvåg. The investors - some modern tourist developers with roots in Nortern Norway – chose the resort concept. It implied the establishment of compact facilities of a top modern hotel and all types of adjacent activities, designed as a group of fisherman's cabins. To make the story short, the main entrepreneur of this project received very much positive reactions, mainly because he managed to market Lofoten as tourist destination. Moreover, according to Viken's informants this entrepreneur contributed to the boost of the consciousness around and image of the fisherman's cabins as something exotic and picturesque[394]. The other side of the picture is that many of the actors that contributed with economic resources had to take losses in connection with the series of bankruptcies and changes in ownership that followed in the 1990's.

The history of development of the tourism industry in Kabelvåg is the result of visionary and active entrepreneurs from within as well as from outside the local communities. But other local actors including politicians and public financing structures have also been necessary positive powers in these processes.

Svolvær

With its concentration of people Svolvær is the only real town in Lofoten. In quantity Svolvær has the majority of the nigh stops in Lofoten, mainly due to the fact that it is the main node for the Lofoten society, in terms of education, transport, business life, and of course tourism. It is the main gate to Lofoten. In Svolvær and in close proximity to Svolvær, tourists find all types of accommodation and many types of leisure activities. In terms of restaurants, pubs and bars, and shopping, Svolvær offers the urban version of Lofoten. The latest development in the town is related to investment in eating and drinking spots and it is related to investment in infrastructure – for example the main square is being refurbished. In addition to the public engagement in investments in public infrastructure Svolvær is driven forward by entrepreneurs that base their motivation not only on future financial prosperity but on the strong identity feeling that is so common in Lofoten.

We have not touched some attractions and locations that are outside the described concentrations. We have no ambition of describing all actors and suppliers in the tourist industry, but it should be pointed out that a range of attractions and spots belong to Lofoten's most famous tourist products. They are examples of the individual innovative spirit and entrepreneurship that exist in the region. It includes a glass blower firm combined with gallery and shop, an old manual forge with a cormorant (Phalacrocorax) as its local speciality, a puppet museum, a mountain climber school, an ice bar (made of real clear ice), and much more.

[394] Op.cit.

Destination Lofoten - The destination company

Having described some of the most important locations in Lofoten, their context, and some of the attractions, we now jump to the sphere of supporting agents. Destination Lofoten is both a tourist industry actor as a commercial unit selling gadgetry, promotional products and information products, and a supporting agent as Lofoten´s joint promotional body. However, this latter function is also partly on a commercial basis. Destination Lofoten has a number of tasks and is responsible for the following:

- International and national marketing, promotion and sales.
- Co-ordinating existing travel trade products in the area, and product development.
- Co-operation with international tour operators.
- The production of promotional material.
- Representing Lofoten at trade fairs and shows.
- Developing a joint profile and Lofoten as a destination.
- Co-ordinated product information.
- Official tourist information.
- Taking care of the hospitality- and information -duties on behalf of the municipalities of the Lofoten islands.

All these tasks imply a range of working task and areas of involvement for this firm. Destination Lofoten takes care of marketing and promotion, on the Internet, and through other channels of communication. Destination Lofoten produces and publishes a number of booklets and brochures about Lofoten, which is distributed from its main shop and office in Svolvær.

Although Destination Lofoten is the officially recognized destination company in Lofoten, for example by being included, and in fact a core actor, in the ongoing development and innovation process that is run together with the municipalities and other supporting agents, other actors in Lofoten have developed their own Internet web sites as promotion for their own services or for information purposes only. A wide search on the Internet reveals that actors outside Lofoten, also foreign tourists it seems, provide information about and Internet experiences from Lofoten as well. Surfing the Internet we in fact get the impression that there is a great variety of Internet sites that promote Lofoten as destination. And if one is not aware of the fact that Destination Lofoten is the official destination company, it is not easy to learn that without studying promotional effort in Lofoten's in more detail.

One of the reasons for the variety of promotion sites (and other marketing material such as brochures) is probably that Destination Lofoten operates with membership fees for Lofoten's tourist firms. The membership costs a few thousand Norwegian kroner a year but it turns out that this cost is too much for many firms, perhaps in particular small firms. Firms may of course have different reasons for not joining Destination Lofoten. Our information indicates that many firms can not defend the annual fee as long as their impression is that the service and job Destination Lofoten does, will not give them value for money. But it is not only financial issues that may stop firms in the tourist industry from paying the fee to Destination Lofoten. We will return to the issue below. There is a certain gap between some of the actors in the tourist industry in Lofoten, in terms of the perspective of how tourism should develop in Lofoten.

This relates concretely to the current official development and innovation process in Lofoten. Destination Lofoten plays a central role as driver and co-ordinator of the ongoing joint public effort to make a marketing master plan for how to go about with Lofoten in terms of tourism. The most challenging task is to fill the plan with contents, measures and actions that are supported on a joint basis in Lofoten, i.e. with the necessary consensus between the six municipalities in Lofoten, the regional and national actor for regional policy and innovation policy, and representatives for the tourist industry.

The six municipalities and Lofotrådet (The Lofoten council)

The region Lofoten comprises of six self-governing municipalities. The four municipalities southwest in Lofoten are small. Røst, Værøy, Flakstad and Moskenes have only between 650 and 1500 inhabitants each. East in Lofoten Vestvågøy and Vågan are larger with around 10 000 inhabitants each. The four small municipalities are all among the communities in Norway that are most dependent on fisheries. Additionally the tourist industry is important. Although fisheries are certainly important for the two larger municipalities as well, they depend relatively more on agriculture and public and private service industries. Based on their differences in terms of industrial structure, the authorities in the municipalities have their own industry specific challenges, concerns and agenda in terms of development. While Vestvågøy has a strong concern for its agriculture industry, Vågan has a stronger focus on service industries and education. However, all six municipalities have a strong focus on innovation in the public sector, and this focus and engagement is reflected in what is going on in Lofotrådet.

Lofotrådet is a co-operative body for the six municipalities in Lofoten; Røst, Værøy, Moskenes, Flakstad, Vestvågøy and Vågan. On behalf of the whole region the council works with common development challenges. The purpose is to prepare and arrange for development processes that indirectly and directly may contribute to innovation in trade and industry and in public service in the region. Lofotrådet is strictly aimed at coordination and consideration of common affairs that may promote Lofoten as region. According to the rules, the financial part of cases on the agenda shall be clarified before joint action is taken. Cases that may have a negative outcome or cases in which one or more of the member municipalities are competitors are not considered. The decisions that are made shall have consensus as objective. Political affairs that do not have approval from all the member municipalities, shall be kept outside this regional political co-operation, and shall be brought to solution in the relevant municipality.

Innovation Norway

As of 1 January 2004 the new state owned company Innovation Norway has replaced the following four organisations: The Norwegian Tourist Board, the Norwegian Trade Council, the The Norwegian Industrial and Regional Development Fund (SND) and the Government Consultative Office for Inventors (SVO). Innovation Norway is the most important innovation policy actor in Norway, nationally and regionally. In the county of Nordland, to which Lofoten belongs, Innovation Norway has offices in the town of Bodø. The former SND has a long historical record of supporting industrial life in Lofoten. The most dominant support activity historically is loans and subsidies to industrial infrastructure such as buildings and machinery. The inclusion of the Norwegian tourist board and the Norwegian trade Council with the main economic and innovation policy agent (SND) has brought the

heavy national marketing effort of Norway and Lofoten as tourist products within the domain of Innovation Norway. The new Innovation Norway as from January 2004 is thereby also engaged in targeted innovation measures such as product development support and other types of innovation activity support. Based on the overall objective of promoting profitable industrial development, Innovation Norway seeks to trigger development opportunities and possibilities in regions such as Lofoten. Innovation Norway is aiming at contributing to regional development through the support of innovation, internationalisation and profiling/branding. Within the new vision– "We give local ideas global possibilities" - Innovation Norway proclaims that the tourism industry, entrepreneurship and small and medium sized firms with international ambitions will be the main areas of effort.

5.4.2 Innovation activity

Measuring innovation quantitatively is very difficult in the case of Lofoten. The Norwegian innovation survey (representing the Norwegian part of the Community Innovation Survey) does not provide figures on innovation activity or innovation behaviour on the regional level of Lofoten. It is at best possible to get data from the county level of Nordland, of which Lofoten is a part of, but the observations are few in each industry sector, Lofoten is not possible to isolate and the utility of the figures is therefore minor. If we apply a perspective of innovation as industrial development, however, there can be no doubt that there has been intense innovation activity and innovation behaviour in the industry in Lofoten over the last 20 years or so. There has been a constant renewal and development of Lofoten as tourist product, including the quantity and quality of accommodation, the existence and refinement of attractions and adventures, and the development of infrastructure and supporting functions.

Entrepreneurs/entrepreneurship and innovation in Lofoten

As we have emphasised above, many of the historical observations of some of the main locations in Lofoten are done by Viken[395], who can be considered a Nestor of tourism research in Lofoten and Nortern Norway. His perspective in the book from 2001 is how different types of entrepreneurship or roles of entrepreneurs seem to have been in operation in development processes across Lofoten. Viken differs between "imitative entrepreneurship", "innovative entrepreneurship", "the society entrepreneur", and "entrepreneurial environment". His hypothesis about the great significance of entrepreneurs in the historical development of Lofoten is confirmed, even though the author himself questions his own methodology of focusing strongly on the significance of entrepreneurship in the interviews. Summing up Viken's observations, many of the attractions, accommodation products and tourist products bear witness to innovative capacity and active entrepreneurship. It is also right to say that much of the innovation has been imitative entrepreneurship in the sense that actors have copied each other, or they have made their own variant of a model they have seen somewhere else. This is of course not a bad thing. On the contrary, in a historical perspective a certain degree of imitation in terms of solutions and tourist products has probably been essential for the development of Lofoten as a tourist destination with a unique identity and character.

[395] Viken A., **Turismeutvikling i Lofoten**, chapter in the book edited by Viken, **Turisme. Tradisjoner og Trender**, Gyldendal Norsk Forlag, 2001.

Firm level innovation – influenced by the short season

Let us attempt to grasp firm level operation and innovation in tourism in Lofoten. An important basic factor to take into consideration is the short season. The short season affects significantly how the typical small firm in the tourist industry has to plan and solve operation, and how it can develop and innovate. As mentioned smaller (often family owned) firms offering accommodation are forced to think innovation in a very concrete sense of the term. Innovation to small suppliers of the tourist product Lofoten is very much the concrete development of the service within the context of the short season. Owners and operators of fishermen's cabins may consider refurbishing another fisherman's cabin or they may make the decision of investing in a café that can serve guests. In a more abstract sense this concrete type of firm level innovation is of course crucial as it produces and develops the impression and the adventure the customer/tourist receives when she arrives and stays. But the short season is really influencing the alternative courses of action. In general existing small tourist suppliers find themselves in a situation where a very large share of their annual income and profit is made during two months in June, July and August. This poses a fundamental challenge in relation to manpower and flexibility. Small firms mainly have two solutions to the flexibility problem.

Many small firms are family owned and most families are historically involved in fisheries or in other work activities in the local community. Historically these families know of nothing else than the seasonal change of the fisheries. Manpower in families embody a flexibility it is difficult to imitate in a firm. But time has changed in Lofoten's local communities as well. The typical small boat based fisheries are threatened; hence the whole community is threatened. The generation that grew up there in the 1950s and 1960s is the one that has started tourist firms, but the further recruitment of manpower to these firms is very difficult. Young people typically move out to get an education. The local and regional education system does not manage to contribute to the total need for recruitment of manpower.

The other answer to the lack of flexible manpower is contract work. The current situation in many of Lofoten's tourist firms is that they already depend on "foreign workers" during the high season. A large number of young people, foreign students or other flexible human beings, from Scandinavia in particular, are seasonal workers in Lofoten in June, July and August. A share of these workers has come in contact with Lofoten through education in Lofoten and in Northern Norway. On the one hand they represent an appreciated resource in Lofoten, because they make the high season possible. On the other hand they are symptomatic for Lofoten's tourist firms' problem of recruiting people with local knowledge. And deep local knowledge in tourist firms is probably a necessary, if not sufficient, factor if the current picturesque image of Lofoten is to be maintained. The tendency of contract work by foreign workers, in particular together with the large chain's potentially standardised profiles, is probably doing something about the image of Lofoten. Whether it is only negative is difficult to assess. But it seems clear that there is an essential difference between the domination of family owned tourist firms with local knowledge rooted in a dynamic and vital local community and the hotel chains' establishment of an artificial local community that opens in May and closes down in August. There exist both in Lofoten today and it is possible to argue that it is between these two trends the battle stands.

Recognising the short season as a main problem in Lofoten, hardly any supplier in the tourist industry is currently able to have steady operation, turnover and income throughout the year, several actors have this issue on the agenda and are about to do something about it. As we shall come back to below, firms and policy makers in Lofoten have slightly different perspective to this issue, but both policy makers and firms are crucial actors in this system.

Innovation in tourism as broad and policy driven

Larger firms or (smaller) actors with more resources, specific roles or qualifications may have the possibility to think completely new about innovation in tourism; on a larger scale and broader. Actors within this type of innovation may help to establish a complete concept of tourism on which a range of tourist products may be built. An example can be found in Nusfjord/Ramberg in Lofoten, where the Norwegian Rica hotel chain has established a tourist product portfolio within the picturesque but threatened local community. Critics argue that this fishing village, which is officially preserved and one of the best preserved fishing villages in Norway, deserve more than being more or less closed down during the winter season. In addition to the few cases of comprehensive product portfolios built up by investors and private chains, it is above all policy actors that represent the will to think comprehensively in terms of innovation in tourism in Lofoten.

Perception and perspectives of innovation in tourism

We shall in the following analyse innovation in tourism in Lofoten by studying how the tourist industry depends on and interacts with public initiatives and policy processes. The focus will be less on the firm based most concrete type of innovation in tourism and more on how innovation in tourism as concept development and development processes is conditional for more concrete innovation. A perspective of innovation in tourism as concept development investigates the conditions that are constructed for concrete entrepreneurship and concrete innovation in firms. It has to do with how strategic projects and processes establish guiding principles in public policy, which in turn influence development of and investments in tourist concepts and public tourist infrastructure facilities. It has to do with regulation of land utilization and the development of property regulation policy, and how regulations put restrictions on location and aesthetics of buildings and infrastructure for tourism related purposes. And, more concretely, it has to do with innovation policy and how measures and support for industrial actors guide innovation as entrepreneurship and product development in firms.

Focusing on innovation and development in an industry such as the tourist industry, different perspectives can be employed[396]. The functional perspective implies to look at the tourist industry in commercial terms – i.e. to focus on innovation in tourism as business development. The territorial perspective implies that development is based on how the tourist industry can serve a region or a locality – i.e. the community in question – without merely exploiting it commercially. It is this latter perspective that is the background for the Norwegian tourist industry's emphasis on the development of small communities. This perspective, which is present on a national basis, implies that the tourist industry shall provide

[396] Viken, to which we referred in the former footnote, utilises a taxonomy of conceptualisation of development perspective discussed by Aronsson L. (1989) **Turism och local utveckling. En turism-geografisk studie**. Meddelanden från Geografiska institutionen. Serie B nr 79. Göteborg: Kulturgeografiska institutionen.

communities and localities with vitality. The rationale works the other way around as well. Vital local communities are at the core of Norway as brand name, tourist product and destination. See www.visitnorway.com for an overview.

Yet another perspective looks at the driving forces behind development and is more in line with the aspects we have emphasised above. Within this type of perspective, while Viken focused exclusively on the role of (different types of) entrepreneurship, development is explained as the result of human beings' actions, either actions done individually or on behalf of or within an organisational, institutional or networked context. As part of this we may include explanations at a cultural level where the interaction between the actors (often in networks) and their social and cultural contexts is emphasised. Innovation and development in this context depend on conditions such as natural resources, markets, economic and political institutions and systems. Within these conditions individuals, local cultures and local policy systems may contribute with influence on development and innovation.

It is our objective to approach an empirical description of innovation and development in the tourist industry in Lofoten by discussing how the mentioned different perspectives are present as guidelines. In order to do that it is crucial to explore what kind of knowledge and competence the different perspectives rely on.

5.4.3 The knowledge and competence base of tourism in Lofoten

The tourist product of Lofoten is built around the common denominator of the traditional fishing industry's activities. In all the six municipalities of Lofoten, fisheries represent the most central carrier of industrial activity and cultural heritage. The exotic culture of this central industry is wrapped into the scenic nature in Lofoten, the original architecture, the small, picturesque localities and the way of life in the local communities. The perhaps most common tourist product in Lofoten is the adventure of seeing and feeling the nature and living the life of the inhabitants, in particular getting a touch of how fishermen live and lived. But the tourist experience of Lofoten has been expanded the last decade. In addition to accommodation in the fishermen's cabins and the organised fishing tours, a range of tourist products and services has grown up. It includes the establishment of cafes and restaurants, and it includes a number of galleries, museums and sights. More or less extreme and more or less organised tours and ways of experiencing the culture and the nature, and learning about it, also belong to the product range.

If we recognize this description of Lofoten as tourist product, it is easy to see that the traditional and ordinary life of Lofoten is a central part of the tourist product. Consequently, the knowledge about this life and the competence to reproduce it into a product that is possible to consume for tourists is basic and a central component of the knowledge base of Lofoten's tourist industry. Inhabitants of Lofoten and the actors in the tourist industry are the carriers of this knowledge and competence. And they are the ones that have to maintain the knowledge and competence. This is not a trivial issue, as we shall come back to. In talks and discussions with operators in the tourist industry across Lofoten there exist what we may call a general and shared consensus about what Lofoten is for tourists. This consensus seems to exist also when the theme is innovation or development of Lofoten as tourist destination. But there are important nuances in people's perception of Lofoten as tourist destination and people's attitude towards development of it.

In addition to the public opinion about how Lofoten should develop as tourist destination, a limited number of processes and actors represent the main carriers of the knowledge base. They represent the actors that have the most systematic perception of and knowledge about this theme and they are probably the actors with the strongest influence on the processes that are running. Below we elaborate and discuss how different actors produce and maintain the knowledge base and how these processes contribute to nuances in the shaping of the (direction of the) development path of Lofoten as tourist destination.

Two knowledge based perspectives to development and innovation in tourism

1. The Master Plan process

The work with the Master Plan is the current main effort of the local and regional policy level aimed at constructing a knowledge base that can feed into development of tourism in Lofoten. It is a collaboration project between the "Lofoten Council (Lofotrådet)", which is the collaborative forum of the six municipalities in Lofoten, the destination company "Destination Lofoten" and the national and regional innovation policy actor "Innovation Norway". The overall objective is to come up with a new regional plan for development of tourism in Lofoten. It includes a preliminary phase in which a SWOT-analysis (Strength, Weaknesses, Opportunities, Threats) is done. As part of this effort three scenarios for tourism in Lofoten have been elaborated. Moreover the project includes further work which is focused on focusing at challenges and tasks. In practice the current phase, which is the phase of the main project, is supposed to come up with tasks, measures and concrete projects that shall support development of tourism in the right direction.

The work with the Master plan represents an important and significant production of knowledge about tourism development that can feed into innovative processes in policy making and firms. The processes that are established have its regional political anchor in the municipalities and the Lofoten Council, it has its coordinator and industrially relevant anchor in the destination company and it has its professional management in a national consultant group with specialised competence within tourism development.

The White book on tourism development

It is this last mentioned national consultant specialised on tourism development that represents the main carrier of the systematic knowledge base in the case of Lofoten. This actor has had the project leadership in the making of the Norwegian White book on tourism development, which was finalised in 2003. The framework in the White book is utilised in the Master plan process. The White book is meant to be a guide and a toolbox in the customisation of development projects for different destinations. The objective of the White book is to improve processes and results in tourism and destination development. It shall be a work of reference describing processes, tools and experiences. The White book's target group is the regional offices of the national innovation policy maker "Innovation Norway", destination companies, actors involved in industrial and commercial development, tourism actors, municipalities, investors and others.

The point of departure or the basic rationale of the White book is that the attractiveness of the tourist product (the location, place, and region) is shaped by the physical and product related properties/qualities of the place, the expressed demand or wish from the market and the experiences of the guests/tourists. In sum the Master plan process gathers policy, industry and

innovation expertise in a framework that is comprehensive in the sense that it theoretically includes any potentially relevant aspect or stakeholder. In theoretical terms the White book considers tourism development as a "muddling through" process. In the theory of muddling through the planners place themselves "in the real life" and discuss, negotiate, consult and propose different alternative courses of action and solutions in the context of different actors and stakeholders who are expected to defend their own interests. The course of action or the result is thereby partly unforeseen as the result is based on balance of power between stakeholders. The immediate reaction is that this seems to be a vague and risky planning method. And, as the White book argues, experiences from real cases also confirm that vague objectives foster implementation processes with no obligation. The White book therefore takes this into account and emphasises that it is crucial that the result of the discussion and dialogue out there is owned by the stakeholders. The processes have to be adjusted to the need and will of the stakeholders to take action in each case. Moreover, the case is certainly not an anarchist process. It is emphasised that the course of action will be under strong influence by a set of stable variables such as nature, climate, culture and infrastructure, and a set of relatively less stable variables that is subject to political decisions, such as regulations, land utilization and so on.

Utilising the framework of the White paper Lofoten's Master plan project has developed three scenarios of Lofoten in the year 2015. Scenario building is a method of visualising implications of different development paths. It is a method that concretely engages stakeholders' opinions about where they want to go in the future. It contributes to the making of a common platform and consensus about the central challenges that Lofoten faces as a region. The three scenarios are all pushed to the extremes in one way or another. They include one very happy picture, one definitely not so happy picture and one picture that is somewhere in between. All three pictures include stylised development paths of policy perspective and policy efforts, infrastructure development, industrial development, demographics and the interaction between market demand and dynamics and market strategies.

2. Environmentally based development of tourism and local communities

The second perspective to development of tourism in Lofoten that we emphasise here has strong roots in the combined tourist supplier and education institution called LTE, Lofoten Tourist Enterprises AS. LTE is driven by a local entrepreneur localised in the far west of Lofoten. The entrepreneur has wide experience from tourism education and together with local engagement in an environmental perspective he has established a systematic knowledge based perspective to tourism development. The perspective sees the preserved nature and vital local communities as a prerequisite to the establishment and maintenance of a good tourist product. The perspective implies strong guiding principles concerning many aspects that are related to tourist development.

The perspective emphasises the importance of developing a tourism product that is in balance with the local community and its capacity. It is the notion that the local community's specific character is at the core of the tourism product. The perspective is comprehensive in the sense that it considers most aspects that are relevant to a tourist's impression of the place. It includes the natural landscape, the cultural landscape, cultural monuments, architectural style and building tradition, fisheries and other business activities, social and cultural life and

traditions, traffic management, transport, accommodation, food and drink service, activity portfolio, attractions, tourist information and other services.

The LTE-perspective is conservative in the sense that it is distinctly profiled within the values of preserving local communities. As part of this and at the same time, LTE communicates the vision and ambition of developing the tourist product of Lofoten into a knowledge intensive product. It implies establishing processes that consciously build up the knowledge base on which local communities are based. Given the profile taken this implies production, exploitation and diffusion of the knowledge and competence relevant for the local community, including the aspects mentioned above. In concrete terms, LTE organises on the one hand education and training within this perspective, on the other hand LTE is a tour operator and is engaged in other tourist products such as a museum. Moreover LTE has taken on the function of providing tourist information within the western part of Lofoten. In line with the specific perspective taken, a brochure has been printed that reflects the notion of environmentally sustainable tourism development by paying special attention to local knowledge, local culture and local specificities in terms of sustainability.

The tourist firms

As a third type of actor that represents the knowledge base of tourism in Lofoten, the tourism firms have of course to be emphasised. As in most industrial firms there is need for business competence of how to run a firm, financially, in terms of organisation and so on. But, focusing on innovation and possible development paths for tourism firms in Lofoten, there can be no doubt that the basic knowledge and competence of the way of living in Lofoten is a crucial component as well. Our description of firms and the industry above indicate that there has been a strong dedication to the perspective of presenting Lofoten, its nature and its way of life as it used to be. This is the perspective within which a large share of the tourist firms in Lofoten has developed their products and services.

There are of course examples of firms that have gone further by developing completely new products based on a more open perspective to what the tourist product of Lofoten will be in the future. But very few firms have violated the unwritten law of presenting Lofoten as something completely different. There are a few cases that have been criticised. It has in particular to do with how foreign investors and large corporations chose to organise the tourist product. Our point is that the two perspectives above represent strong guidance to what firms do and do not. Let us discuss this a bit further.

The issue of operative and development competence in the mainly small tourist companies connects intimately to the issue of recruitment and the problem of maintaining the knowledge and competence base. The rationalisation of the fisheries and the modernisation of the communities are factors that have influenced on the mobility of young people. There are only very limited local possibilities for education, hence unfortunately they need to move out of the region to get an education. This fact together with the fact that the tourism season is very short with a resource demanding peak makes the recruitment of employees to a very difficult case. A volume increase in the tourism industry is therefore not easy to handle. Small tourism firms offering accommodation may solve the problem by depending on family members. There are currently a small number of larger firms that have solved the problem by collaborating with tourist destinations that have the opposite seasonal peak, recruiting people from winter resorts for example. Reflecting on the fact that there is need for local competence

in Lofoten, this is obvious problematic, even though short training courses may solve the problem.

Discussion

The Master plan represents a process that depends strongly on the development path that is constructed by continuing policy decisions in interaction with the other actors in the tourism industry. It is relatively open-ended in the sense that its forthcoming implementation depends on many actors' decisions, to a large extent as a reaction to the framework that policy makers establish. Although the culture of policy collaboration in Lofoten is strong and institutionalised in Lofotrådet, policy making at the municipality and inter-municipality level is not given in the future. As the different scenarios of the Master plan indicate, it is still an open question whether the development path will be dominated by standardisation of relevant policy making and regulations, or whether the individual municipalities mainly will follow their specific interests. One may expect that tourist firms will mainly follow the historical path based on the consensus of Lofoten as we have described, but the tendency of foreign investment and the entry of corporate chains in the industry will definitively put pressure on the existing idyll. The Master plan process does not take a specific point of view in terms of the content of the development path, for example as to whether a specific perspective should be applied as framework for policy or whether the entry of foreign ownership and control need specific attention from regional policy and regulation. The Master plan process is defined and organised as a muddling through process and it is thereby an open question in what direction the development will take.

In some contrast to the Master plan process the perspective communicated by Lofoten Tourist Enterprise has a clear vision of how the tourist industry should develop. LTE has a "green" and community-preserving profile. The profile embodies distinct guidelines for policy making and regulation and for industrial decision making and industrial development. In this perspective policy making and regulation need to take into consideration the historically based features of local communities and business life in Lofoten. Although the perspective recognises the need for a sufficiently developed infrastructure, which necessarily implies investments and some restructuring of the existing, the perspective has preservation and not extension or expansion of the local communities as its objective.

Moreover, embodied in the community- and nature-preserving profile is the consciousness about the importance of building up and maintaining a historical and archaeological knowledge base of Lofoten. It is the core idea that learning and experiencing such knowledge is an important part of the tourist product.

An important issue to consider is the impact of the two perspectives on the development of tourism in Lofoten. In a way it concerns the balance of power between the perspectives. There is no doubt that the Master plan process has a greater potential impact than the community- and nature-preserving perspective. This has to do with the fact that the Master plan process is anchored politically. Moreover, the Master plan process is managed by Destination Lofoten, which in turn organises many tourist firms in Lofoten. This becomes evident in the next paragraph, which is about actors and networks.

5.4.4 Cooperation and networks

As we have already emphasised there is a historical record of cooperation and networking in Lofoten. Our observation emphasises that this applies more to the policy level than to the industry and firm level, at least when it comes to formal collaboration. We shall in this section focus and elaborate on the structure of cooperation in the public policy domain and the tourism industry. We have sketched the structure below. The figure illustrates how financial support on the one hand and qualitative development and collaboration on the other hand is organised between firms, municipalities, tourist offices and local tourist forums, and Destination Lofoten.

The main message from the figure is the interwoven organisation of the tourism industry. Destination Lofoten is the gravitational field towards which financial means flows from the tourism industry. And Destination Lofoten is the main node with which firms and municipality level tourism offices interact. Membership fee from tourism firms is the basic financial mechanism and source to Destination Lofoten. But the municipality level contributes strongly as well, either with directly allocated funds, or with allocated funds via the local tourism information, tourism office or tourism council/association/forum.

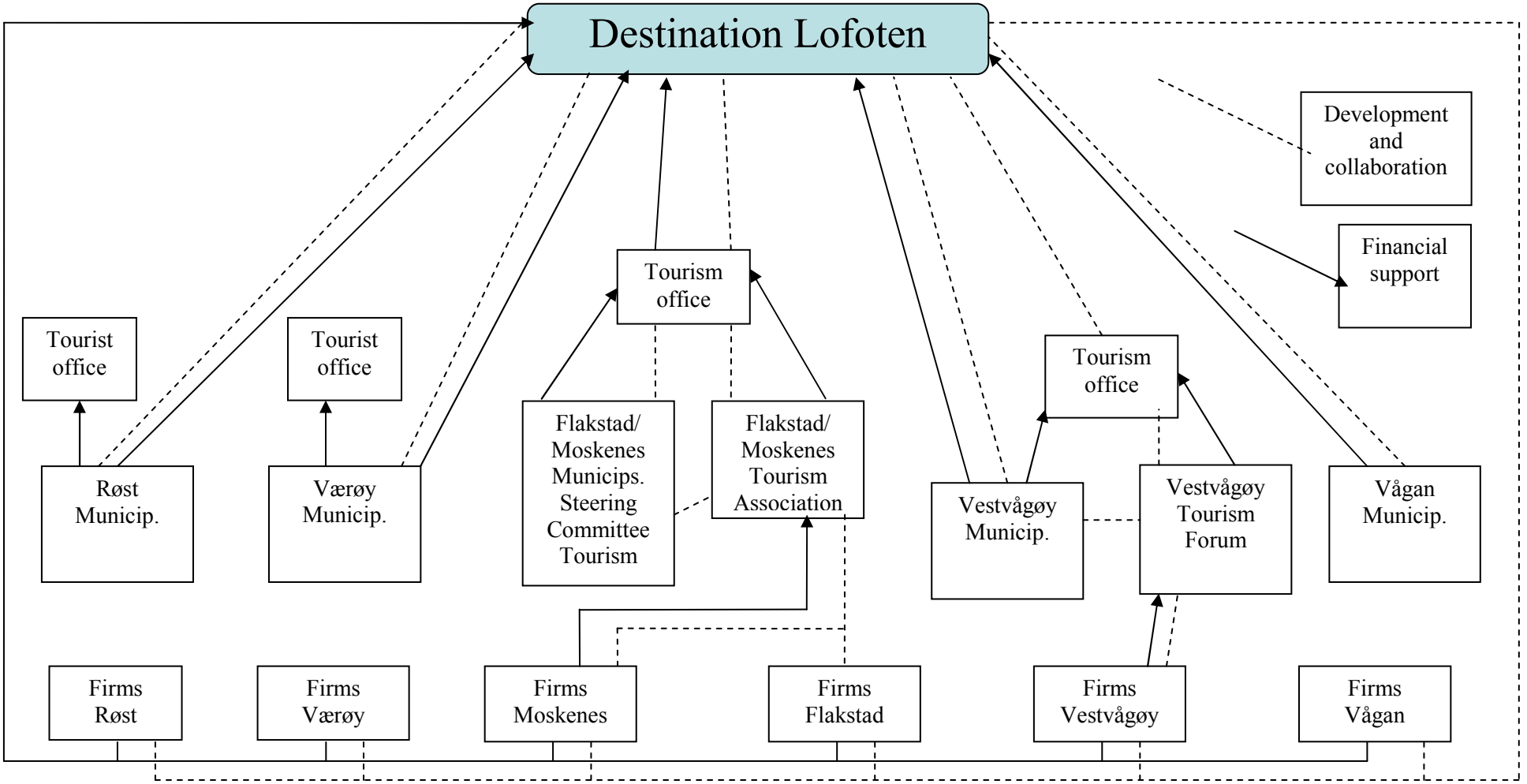
The six municipalities in Lofoten interact with Destination Lofoten with different degrees of proximity. For the easternmost municipality Vågan, in which the regional centre Svolvær is located, the destination company is the local tourism office in addition to fulfilling its role as regional actor. This implies that Vågan municipality allocates finances directly to and cooperate directly with the destination company, a situation which is different from the other municipalities that have local tourism offices. For two of the westernmost municipalities the mere distance to Svolvær where Destination Lofoten is located is larger, and their financial allocation goes through a steering committee on tourism and a tourism association, which have local tasks complementary to the destination company.

The difference in types of relation between municipalities and the destination company implies the possibility for the more distant municipalities to develop their own agenda for tourism development, and this is partly what has happened. This is how the topic of collaboration and networks links strongly to the knowledge and competence base of tourism development in Lofoten. The emphasised Master plan process is the node around which the main knowledge base of tourism development is being built up. The emphasised sustainable local community development perspective to tourism development is in a sense partly the competing partly the complementary knowledge base. The former process is owned by Destination Lofoten and therefore more by the municipality of Vågan than the two municipalities located in the west. The latter perspective is owned by a local entrepreneur in the two more western municipalities.

When it comes to direct interaction between the Destination Lofoten and tourism firms, it is the promotion of Lofoten as tourism product and the coordinating activity of development that is the most important activity. The most important value for the fee paid by the tourism firms does therefore not include concrete help to innovation or product development. Concrete innovation support for tourism firms is supposed to be supplied by the existing innovation conditions in Lofoten, and this is the last topic of this tourism study of Lofoten.

Figure 4-1 Organization of the public policy domain and the tourism industry in Lofoten, Jan. 2004

Idea and design by Lofoten Tourist Enterprise; Ottar Schiøtz and Stig Einarsen, Des. 2003



Before we turn to the innovation conditions we just want to repeat the main tasks of Destination Lofoten;

- International and national marketing, promotion and sales of Lofoten.
- Co-ordinating existing travel trade products in the area, and product development.
- Co-operation with international tour operators.
- The production of promotional material.
- Representing Lofoten at trade fairs and shows.
- Developing a joint profile and Lofoten as a destination.
- Co-ordinated product information.
- Official tourist information.
- Taking care of the hospitality- and information -duties on behalf of the municipalities of the Lofoten islands.

5.4.5 Innovation conditions

Innovation conditions refer to the possibilities for firms to innovate shaped by the external environment. It includes factors that represent barriers to innovation and it includes what we call facilitating factors for innovation; factors that influence positively on firm innovation. Our respondents in the tourism industry in Lofoten live in different realities when it comes to how they experience their innovation conditions. There is generally a moderate degree of awareness of and view towards the current public policy situation. Firms in Lofoten are generally more aware of the local and regional policy situation that the national policy situation. There is a significant difference in firms' awareness and view to the existing public support services, at all levels of geography. The smallest firms, which are mainly family driven firms offering accommodation, have often low consciousness about the possibilities of innovating by means of public policy support. This may vary depending on individuals' personal network and capacity, but the small firm has often no particular resources that can be directed outwards. The internal operation takes their time. Low awareness and lack of information about existing public policy support programmes may represent a barrier to innovation for these firms.

Still, many of the small firms are driven by engaged entrepreneurs that have a strong perception of the importance of entrepreneurship as innovation. The existence of local entrepreneurship contributes to a strong common perception, a strong external environment that feed positively into this kind of innovation. Therefore, the external environment represents a positive facilitating factor for innovation.

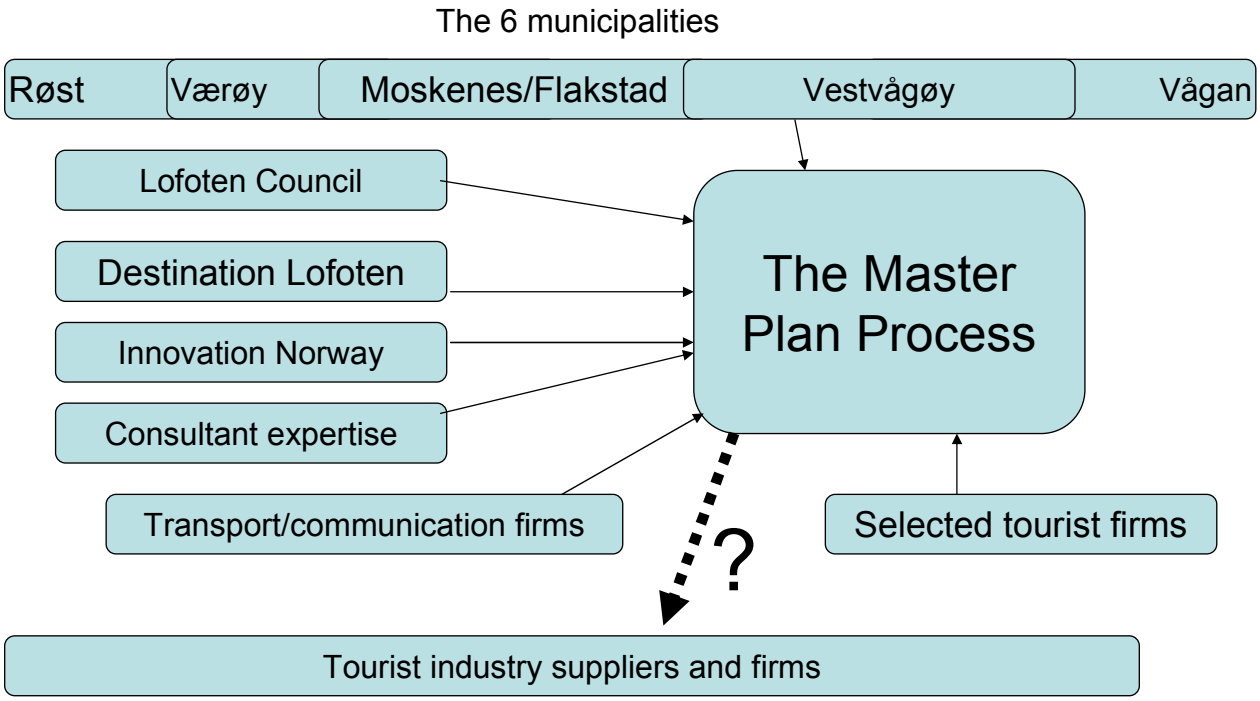
Larger firms have more of everything compared to micro firms. And perhaps most important, they often hold awareness, knowledge and competence of how to exploit public policy support for innovation. This applies for example to one of the largest and most visited tourist firms in Lofoten, the company that runs Lofotr, the Viking site-museum. The company has a distinct strategy of exploiting EU framework programmes and national possibilities for financial support and collaboration about innovation.

The described Master plan process in Lofoten represents a current specific addition to the innovation conditions for the tourism industry. The figure below shows a sketch of the Masterplan and its main stakeholders. How does the work of the plan influence on firm innovation? There can be no doubt that the Master plan process represents a positive

framework that may facilitate innovation in tourism in Lofoten. It is however a good question whether the measures that are being established in the Master plan's main project are able to influence on concrete innovation in the firms. The indications from our respondents are that the expectations are relatively low. Firms do not expect to be able to innovate concretely, but then the main project of the Master plan has not started yet. Some of our respondents indicate that they know little about the process. The ones that know something have the impression that this is a branding process, aiming at improving the visibility and uniformity of Lofoten as tourist product, toward national and international customers. Certain selected large tourist suppliers, such as transport firms and the largest actors, are members of the steering group and they have therefore greater expectations, it seems.

The Master plan project with the project leader Destination Lofoten and the expert consultant seem to have plans for concrete facilitating measures for Lofoten's tourist firms, but it remains to be seen what the construction of these measures signifies for the tourism firms in terms of input to concrete innovation.

Figure 4-2 The Master plan and its main stakeholders



5.5 Findings from the study of the manufacturing industry

5.5.1 Background and introduction

The case studies in Lofoten were carried out through interviews with informants in Bodø and Leknes. The two supplementary cases are Melbu Systems in Melbu in the region of Vesterålen, and Helgeland Plast Ltd in Mo, south of Lofoten, in the region of Helgeland. Interviews were undertaken with general manager Johan Roger Smith-Nilsen, Helgeland Holding/Helgeland Plast, Einar Pettersen, Melbu Systems, Bjørn Kjensli, Leknes, Dag Hansen and Arne Kolbeinshavn, Lofilab, Nils Finstad, Nordland Research Institute, Olav Dyrnes, Innovation Norway, Bodø, Karstein Bye, Nordland Research Institute. In addition, two representatives of an aquaculture production firm in Vestvaagøy (Ellingsen) were interviewed by phone.

Melbu Systems provide products in stainless steel to the fish manufacturing industry. It combines three market segments:

- aquaculture,
- traditional fish industry and
- offshore fish processing (on fishing vessels).

The objective of Melbu Systems Ltd. is to provide

> "…smart solutions which increase customer profitability, and which are recognizable through good service, quality and reliability" (Melbu Systems homepage)

Melbu Systems has a broad spectre of products within the fish processing sector, including complete production lines, as well as components. The core competence in Melbu Systems is within engineering.

HELGELAND PLAST AS is a division of Helgeland Holding, which also includes construction industries (concrete, housing development). Helgeland Plast is an innovation which evolved out of a specialization in plastic tubes used for on shore construction. In 1974, the plastic tube technology was applied for the first time for use in off shore aquaculture – as floaters of cases - by Helgeland Plast.

Helgeland Plast has a core knowledge base in construction and material technology engineering, of 29 employees, 7 are engineers.

Helgeland Plast provides a broad spectre of *cages* for offshore aquaculture production (round, square, submersible/ floating), as well as mooring equipment and other related types of equipment. The company also provide engineering and planning of complete sea-based production systems, including mooring analyses to ensure that the components meet defined strength standards with documented safety factors. HELGELAND PLAST AS provides a number of other services in the area of aquaculture. All parts and components are made of HDPE-80 polyethylene. The choice of pipe size is made on the basis of production needs, net specifications and local conditions. They are designed to optimize the strength and flexibility of the polyethylene material.

In terms of innovation networks, Helgeland Plast cooperates closely with a national R&D institute, SINTEF, and a regional program organized by Innovation Norway, called ARENA.

It has also good experiences from product development financed by another regional R&D program, the NT program.

5.5.2 Knowledge and competence

The core knowledge and competence base of firms like Helgeland Plast and Melbu Systems is within engineering and systems design. The Lofilab case involves not only industrial knowledge, but also biological science based knowledge.

The innovation system is differentiated into two segments.

- The Norwegian Research Council has a core position as financer of research which supports a fairly broad scale of specialized forms of knowledge, supporting the industry (breeding, breeding technologies, fish health, technology for fish breeding and production etc etc). Core knowledge in the R&D system of aquaculture is within biology. This is also the basis of Lofilab
- Firms like Melbu Systems and Helgeland Plast illustrate the small but significant sector of the innovation system which is focussing on production and processing technologies. The core knowledge base of these firms is within engineering.
- At the processing core of the value chain, where people are directly in contact with fish and fish processing, knowledge is tacit, and experienced based (learning by trial and error, learning by doing).

A particular problem has been the segmentation between these forms of knowledge in the innovation system. The solution to this segmentation, which has proved to be efficient for salmon production processing, has been a three tier chain:

Science - support industry - production

Through the support industry role as "translator", science based products are applied in an industry largely operated by people applying locally based tacit knowledge. This is a linear model, but no completely so, as a lot of information is flowing back from the industry into the research community.

Despite this segmentation – various forms of combinations of tacit and codified knowledge are found in more or less sophisticated firms and corporations in the industry, as staff functions are increasingly filled with professionals with university level education – and as some of the families working in the industry has members who are professors in biology.

This evolution of "sticky knowledge", bridging the gap between science knowledge and tacit skills, is in particular emerging among academics who are working in the more practice based parts of the industry.

The production facilities of the industry are located all along the coastline, at locations which are optimal to the requirements of production. More often than not, this restriction has lead to a fairly decentralized pattern, where aquaculture of salmon has contributed to employment all along the coastline. The ownership structure of the industry is mixed, with some small scale and independent producers – combined with attempts to develop a more modernized structure with large scale corporations. However, the attempts to develop a corporate structure within the industry have not resulted in any noticeable improvements in efficiency of *production*

technology, as the "corporate level" has not succeeded in developing serious *technological* competitive advantages.

Despite the development of a corporate segment in salmon production, the innovation system still has a fairly rural way of *sharing information*. The science driven supply industry more often produce products which may be accessed by anyone in the industry – and in the formal and informal networks and organizations of the national innovation system, the ideal is free sharing of information. This has resulted in a rural system of technology diffusion which is extremely efficient, as new technologies are openly accessible to anyone. The dark side of this strategy is a lack of incentive to innovate, as the successful entrepreneur knows that he or she will be instantly copied by others. So far – the balance has remained on the "knowledge sharing" side of this equation. Attempts to monopolize knowledge and control it never has been successful, and patenting is unheard of.

5.5.3 Innovation activity

During the last years, the national innovation system has aimed at copying the success story of salmon with other marine species. 10-15 different species are "in the tube". The most serious attempt has, however, been cod. This drive has largely been based on an alliance between the Norwegian Research Council, NFR, and the industrially oriented segments of the industry. The main objective for this linear national strategy has, accordingly, been to establish a science driven knowledge base supporting a modern process industry – producing domesticated cod.

This national level strategy has proven to be extremely difficult, as a lot of surprises have occurred, reflecting that this field is a new area of research. An important set of surprises has been related to the unexpected behaviour of nature and natural beings. Whereas salmon breeding and salmon fry production was known as a *craft skill* for several hundred years, it has proven extremely difficult to cultivate and feed cod fry properly. Industrially controlled experiments in laboratories sometimes succeed fairly well, and sometimes fail completely, for unknown reasons. These experiments are extremely expensive, and they are going on in a competitive environment, where lots of industrial firms have aspirations to be first. Putting the cod fry into nets in the sea is no easy match either. Cod turns out to be a completely different animal than salmon, behaving differently, feeding differently, and evolving differently. For one thing, cod has strong cannibalistic inclinations. The bigger ones tend to eat their smaller brothers and sisters, when locked up in a closed net. Cod eats and moves differently from salmon, it escapes more easily through nets, cod reacts differently to sounds (it panics and tries to escape from the sound of passing boats), it has other requirements to light and temperature, and it encounters other dangers in nature.

These surprises – and the way they are spelled out – reflect the differentiation between the two layers of science based and tacit knowledge within the industry, as the strategy of science driven product innovation – aiming at intensive cod fry production under industrially controlled conditions. The science driven entrepreneurs encounters the harsh realities of what biologists do not know about the life and death of marine species. Within the national innovation system, which is path dependent on codified knowledge, there is no central level strategy to develop the sticky experimentalist knowledge which may find a way through cumulative practical experiments.

Practitioners within cod cultivation have informal networks of their own, exchanging experiences and views of the new species.

The change to cod is especially important to the biologically oriented components of the innovation system. It does not have any significance for food production technology (Melbu Systems) nor Helgeland Plast.

The extensive and experimentalist strategy of fry production: Lofilab

Lofilab is a small, privately owned firm, with 4-5 employees (8 – 10 in the high seasons). 3 employees have university level education in biology - one is a professional business economist, and the others have experience from coastal industries. A core aspect of this firm is the close ways of working together, where tacit and codified knowledge is shared. At this point, the age of the firm – and the *internal experience based learning processes of the staff* - is a core knowledge asset. Lofilab is – as the name might indicate – a *fish laboratory*. The name must be understood quite literally. The strategy of Lofilab must be understood as driven by *curiosity*, not by rent seeking.

The firm was founded as a public institution by a business entrepreneur from Tromsø in 1987. Initially, it was a public institution, designed from a model of experimental farming used in agriculture, with "best case" farming and experimenting used as an educational example and technology diffusion mechanism. An important national context at the time was an active, state driven effort to promote technology policy. Within the context of Norwegian technology policy, aquaculture of marine species was a core strategy. The initial business idea of Lofilab was consulting, based on knowledge in aquaculture. Most of the time, it has had a biologist oriented towards knowledge development through experiments – Arne Kolbeinshavn - as leader. Lofilab was privatised in 1995, with 1,5 million NOK as capital base.

The business strategy during the first phase of privatisation was halibut cultivation. The attempts to produce halibut fry ended up in a disease problem in 1999. From 50 000 larvae, only 10 000 survived. The Lofilab entrepreneurs made new networks, through contacts with potential industrial customers in southern Norway (NUTRECO) who encouraged them to go into cod fry. Another important relation was with Icelandic fry producers.

From 1999, cod fry became the core strategy.

Total annual turnover is variable, as the firm is experimenting in its own production all the time. Production is season and batch based. This combination results in a highly volatile bottom line, as some batches some years may prove successful, which others are disasters. To keep their experiments going, the risk-seeking Lofilab entrepreneurs are combining private funding with various forms of public money for regional and innovation policy. In the early 1990s the national research funding institutions were central, today it is mostly the regional office of Innovation Norway, industrial customers, and private investors anticipating a future success in cod fry.

The business idea is

"Cost efficient and integrated production from breeding stock to fry"

The Lofilab main office is at the industrial park in Leknes, the centre of the municipality of Vestvågøy in Lofoten, just 5 minutes walk from the airport. The "main office", though, is just

a small part of the operations, which are to be found in various locations along the seawater in the inner bay of the Lofoten peninsula (Ure, Steine).

The reason why the main office is here is, we are told, because here, the staff finds their academic peers. Roughly 50 people with higher degree University education are working here, in various businesses, varying from private consulting to the business of Lofilab, which is cultivating, breeding and giving birth to cod (fry production). This somewhat surprising finding is due to two closely related processes during the 1980s. First, we find a lot of people with university degree education, who were born in the municipality, and studied at the University of Tromsø. In motivating them to moving home after the university degrees, a strong factor was a successful policy of the municipality during the late 1980s. The municipality contacted young locals studying in Tromsø – and motivated them to move home to start business careers in Vestvågøy. A core factor in this mobilization was the "way of life" of the Lofoten islands.

The peculiar history resulted in a small but important local sector of the economy, mostly located in the industrial park. Because of this history, what we find here is academics in Lofilab with a unique and long lasting hands-on experience in codfish-farming and cod fry production. However, the production concept is quite different from the industrially based strategy of *intensive cultivation* which is followed by the national innovation system. First, the academics working here do not have industrially based laboratories and access to core central level funding. Instead, the Lofilab strategy is extensive and based on local natural conditions, using the sea as the laboratory.

Lofilab used to have access to central research funding. During the 1990s, Lofilab was actively connected to nationally funded and initiated experiments relating to "sea harvesting" of cod (production of fry to be let loose into the sea, to be caught through fishing[397]), as well as, importantly, cultivation of halibut. Both of these strategies failed. However, through halibut production, the technology which is currently applied for cod fry production was developed and perfected.

The production of cod fry started in 1988-89. Total production in 1989 was 10 000 fry. This production was close to the natural production process, utilizing the fact that Lofoten is the breeding site of the Norwegian Arctic Cod. In Lofoten, the Arctic cod is breeding every winter at sea. In cod fry production, breeding is controlled in a laboratory. At an early point in time, the eggs are returned to natural sea based conditions, and the fry develop, feed and grow in sea – utilizing as close as possible the natural conditions of the sea water. Importantly, food for the larvae – plankton - is natural. This is done through closing off a small fjord, which is fertilized and used for plankton production, which is the natural food for the cod larvae. After 40 days, the larvae is turned into a 2 cm long cod (0.2 g) which is put into the sea water in closed caskets, feeding from natural sea production of plankton. The fry is later placed in production facilities which are embedded in the sea – within the closed fjord system. An important part of the cultivation process is sorting by size, to limit cannibalism.

The first year, 1999, they planned to produce 600 000 fry. Meanwhile, crabs made holes in their nets, and they were only able to rescue 180 000. 2001 was a good year, with a fairly high

[397] This idea proved to be economically unsustainable, as fishing-based re-catching by far did not fund fry production

production (180 000) and soaring prices (NOK 30). 2002 looked promising, but then a pump failed, and unforeseen waves of cannibalism killed off a large part of the production. 2003 was an excellent year in terms of production, and it proved that most of the technical problems were solved. But then, the crises hit the salmon industry, and fry prices were lower than ever (10 NOK).

Due to the long production period, Lofilab have a superior *breeding stock*. The breeding fish today is the result of three generations of controlled selection, where the best fitted fish is used for breeding. The business idea of Lofilab is cost efficient cod fry production. Its customers are core industrial actors in the new and emerging cod production industry, mostly large scale corporate actors with a background in salmon production. The production is characterized by risks and learning by doing. In addition, it is highly experimental, as new solutions are tested, to optimize production.

As Lofilab is following an odd concept of production, different from all others – it is often criticized for being old fashioned and not able to compete. Consequently, in 2003, a new strategy was tested in order to approximate a more industrially based approach: that of trying to produce 3 batches. This expensive experiment of intensive production failed. This failure happened to coincide with an exceptionally bad year among the customers, who are living from salmon production. Norwegian salmon producers are facing a harsh global price competition from Chile, and several others. This is seriously reducing the funds which they may diversify into high risk cod production.

As a result, Lofilab is currently fighting hard to survive.

The Lofilab mode of fry production is experience based and extensive, basically because it only allows for breeding when the natural conditions of the sea water are optimal. This makes up only two safe batches of production each year. In a closed industrial system for fry production, on the other hand, production may be more or less continuous, as production seasons may be altered industrially, through control of parameters such as water temperature and light. This strategy of intensive production has been promoted by the Norwegian Research Council – and followed by the main actors within the national innovation system.

The downside of intensive fry production is that so far, it simply does not work very well. The most serious problem is the weak condition of the industrially produced fry. It is growing slowly, it has a high mortality rate – and a disturbingly high rate of deformities. So far, industrially produced fry, which is competing with the Lofilab fry, simply has not proved to be a good business idea.

This is why Lofilab claims that

> ***..Based on production figures from 2002 and 2003 it is currently 5000 – 6000 ton of biomass (cod) at sea – after subtracting 1000 tons of wild caught fish. Of this Lofilab fry contributes with 2750 ton biomass, or well above 50% of total production***. (Dag Hansen, marketing responsible, Lofilab AS, 20.10.04)

This **50% of national cod production** must be seen in relation to **30% of the input of Lofilab fry**. The explanation to this is, of course, a superior performance in terms of survival and growth of the Lofilab fry.

Given this success story, one might think that Lofilab was at the core of national and regional innovation policy making. Quite the contrary, Lofilab has been marginalized within the context of the national innovation system, because it has been stuck in a strategy which is diverging from the mainstream focus on *intensive industrial fry production*.

5.5.4 Collaboration and networks

Whereas Lofilab is struggling to come around some of the corners of fry production, the main emphasis of the regional policy network on aquaculture has been those of *cod production*.

This is the focus of the ARENA Innovation Aquaculture program. ARENA innovation mari-culture is funded by three national institutions. Innovation Norway, the Norwegian Research Council, and SIVA, which is a national institution funding science parks. The program is funding regional level networking – and including banks, regional university level schools (Høgskolen i Bodø), the regional office of Innovation Norway, and private industrial interests. The objectives are

- Increased interaction between educational institutions, research institutions and private industry
- Development and exchange of knowledge relating to optimal production in aquaculture of different species and different phases of the value chain
- Technological solutions adapted to commercial production of different species
- Development of forms of organization capable of relating better to market conditions
- Efficient exploitation of infrastructure and available capital for financing of development work

The program includes work in "meeting places", networking, initiation of projects, and education. It is also aiming at developing the industrial part in Bodø – where aquaculture firms are based. Whereas other firms, like Helgeland Plast are participating the ARENA project has not developed relations with Lofilab. We are told that this partly is due to potential tensions between different actors in the network, where some of the industrial actors are involved with the intensive strategy of fry production, which is the competing concept.

5.5.5 Innovation conditions

Historically, innovation conditions in Norwegian aquaculture were characterized by the flow of money generated by the privileged position of Norwegian salmon producers in the global market. There was a great interest in experiments, and the industry was experimenting, growing, and investing in new equipment. This speeded up the development and innovativeness of the national system. Today, the situation is diametrically opposite. Current innovation conditions are characterized by the difficult economic situation for primary salmon production, which has significantly reduced investments in new production facilities. This in turn, undermines the over all market for the supply industry, and makes it more difficult to invest in new technology projects. Private actors in primary production are doing their best to cut costs and stay floating. These are not times for new, expensive experiments. At the same time, the need for more cost efficient production technologies is greater than ever. Perhaps new and efficient *technologies* could be the solution which makes the industry sustain the current crises? Questions like this potentially gives Innovation Norway and the Norwegian

Research Council a more critical position in the innovation system, as they – and not any more the private actors - have the capacity to fund new projects and developments. So far, as a result of the national discussion on innovation policy, it still remains unclear weather the state for ideological reasons is *willing* to assume a more proactive and developmental role, and allocate resources accordingly.

The innovation process aiming at achieving ***"cost efficient and integrated production from breeding stock to fry"*** depends on a long, cumulative process of learning through trial and error. A firm able to perform cost efficient fry production which may serve as input to a successful cod production must have an extremely complex knowledge base. This knowledge base obviously has to include sophisticated combinations of science based knowledge and craft skills. It must be developed through a series of experiences in overcoming several practical problems. Lofilab is quite obviously set on a journey of experimentation which is heading in precisely that direction.

Given the fragile state of the Lofilab economy, and the hazards of the landscape it operates in, keeping this cumulative learning process going for 10 years is this is quite an accomplishment. An important underlying factor in motivating both public and private funding and refunding is the expectation of a future success in the production of cultivated cod. Lofilab has been and is seen as a part of a future success story. The main supporting agencies of Lofilab at the moment are its future customers, private business investors – and Innovation Norway.

5.6 Conclusions

Knowledge and competences in Lofoten

Agri- food

- The people in the agri-food sector in Lofoten, has little formal education besides high school and vocational subjects, some of them have higher education, but there are no such educational establishment in the region. The Norwegian education and research system for this sector is located in the central part of Norway, Oslo and Akershus, which is a problem since the local agro-food production to a larger degree, are dependent on high competence.
- The firms in this case study uses for the most product- and process specific knowledge generated outside the formal education system and are more based on practical knowledge, generated through trial and error, copying and, purchase of machines and equipment which is often referred to as synthetic knowledge base. Besides this we see that the agriculture sectors among many other sectors make use of a more analytical knowledge base, which is related more to a science and R&D based knowledge.
- The agri-food firms in Lofoten show a very good knowledge about processing, but many of them can be stagnant due to low volume. They have often too little marked related knowledge. The firms are dependent on local knowledge and are not systematically connected to other knowledge providers and large scale actors in the innovation system and this is partly due to the lack of a more theoretical knowledge base. They are in a large degree dependent on suppliers or customers ability to 'translate' this kind of knowledge. The firms also have to be more open for learning from radical new sources.
- There is a need for quality control and better access to systems for testing and tasting. A general lack of resources and control makes the firms vulnerable for external events and they do not manage to control the value chain especially when it comes to the market.
- To increase overall performance, firms must improve their competence and knowledge in industrial production, marketing, business management, partnership with large scale actors and strategic entrepreneurship.

Tourism

- The industrial knowledge base of tourism in Lofoten is mainly the way of life of Lofoten, as it is today or as it used to be. Mainly small firms present this by employing local workers with the right qualification. It implies the need for mainly practical knowledge; in accommodation (fishermen's cabins), in food (fish in general, stockfish in particular), in attractions and museums, and in relaxing or extreme activities.
- There is an evident need for more analytical knowledge (formal education) in firm innovation. We have focused on the knowledge and competence base that feed into broader development and innovation processes. Two perspectives emerge as dominating.
- On the one hand, an "academic perspective on green/sustainable local community development" is communicated, implemented and diffused by a local entrepreneur who is active in business as well as in education within this perspective. The perspective is very focused on knowledge about how to preserve and develop the local communities as they

were, and to do this by preserving nature. In terms of development direction, the perspective provides strict guidelines to public policy and regulation.

- On the other hand, the knowledge base is being established and maintained in a comprehensive development process involving the policy level and the destination company (Destination Lofoten), which represents the majority of the industrial actors and has a mandate to operate and develop tourism in Lofoten. The knowledge base in this process is a kind of ”value neutral muddling through” policy process based on the new National Tourism White book (published by the national innovation policy maker Innovation Norway) by means of consulting expertise.
- The process is run by the destination company in interaction with the six municipalities in Lofoten and their collaborative agency The Lofoten Council (Lofotrådet).
- In terms of development direction, the perspective and the process provides less strict guidelines to policy making and regulation. The process opens up for the specialised interests of each municipality and their attitude and policy toward foreign investors for example.

Manufacturing

- Lofoten has a strong knowledge base in aquaculture, mainly in the craft skills of handling fish as a living and domesticated animal
- In the case of Lofilab, this craft knowledge base is combined with analytic skills, and an in-depth knowledge of fry production, based on 15 years of experience.

Innovation activities in Lofoten

Agri-food

- In the land based food industry, the industrial actors work with innovation by focusing on niche products and the value of Lofoten as highly recognized brand. In the land based food industry standardised products and large scale production suffer from lack of critical mass. The tendency is that processing is moved out of the region.
- Too many (small scale processing) firms are surviving due to owner’s acceptance of ‘working for nothing’ and no investments pay off. Innovation and development activity is to large degree an integrated part of the daily work, so most of the firms are working deliberately with development, improvements and innovation. This is both product and process innovations, but is for the most incremental innovations and not radical innovations.
- There are several reasons why the firms innovate, but this is often related to a new variant of a product or that have received new equipment from a supplier. The generators and drivers for innovation come from different actors, but most frequently from customers, internal personnel, suppliers or competitors. Despite that the firms innovate, our impression is that the turnovers come for the most from unchanged products.
- When it comes to bottlenecks for innovation, the firms (especially small scale) report that this is due to lack of resources, low production volume and they are not professional enough. This can partly be explained by the size of their activity and that there is a need

for larger investments to increase volume, turnover and number of employed to generate more experiences and innovation opportunities inn connection with the daily work

- The region has strong traditions and an individual form for production structure, which result in a relatively strong resistance towards reconditioning and innovation. Collective agreements like for instance a common branding company must be put into consideration instead of individual performances at the market places.

Tourism

- Innovation activity is historically a good combination of radical new product (attractions, activities, food, and accommodation) and imitative innovation (investing in another fisherman's cabin).
- Entrepreneurship is central to tourism development in Lofoten, both individual entrepreneurship and organisational or society entrepreneurship.
- In accordance with our perspective of the knowledge base, we understand important innovation processes as based on either the "academic perspective on green/sustainable local community development", hence with strict limits to what is possible to do,
- or based on the "Value neutral" policy process based on the new tourism White book and consulting expertise, run by destination company and collaborating municipalities, a more liberal attitude towards investment and innovation, which leaves the future of Lofoten more uncertain.

Manufacturing

- Cod production, using salmon technologies
- Experimental development of extensive forms of cod fry production

Cooperation and networks in Lofoten

Agri-food

- Agriculture in Norway is an individual industry and at the same time often consists of small firms where the owner-founder-manager-operator is the same person. This gives easy links between vision and experimentation, but fewer organizational relations and bindings to who-do-what and openness for learning from radical new sources. So not surprisingly, customers and suppliers are the most important cooperation partners for the firms, locally, regionally and nationally in connection with innovation.
- The value chain in the agri-food sector in Lofoten, as well as in Norway is to a large degree characterized by close relations between the producer and industry, since the cooperation is owned by the primary producers. There are great many actors involved in both upstream and downstream activities in this value chain, but there is no uniform structure of the value chain in this sector. It varies between the different products and the size of the firms. Despite this, several of the same companies are both involved in upstream as well as downstream activities in the same production groups, but this is usually larger firms.

- The small scale firms have on their side little cooperation and relations beyond the input from suppliers of raw material. They are also rarely in contact with suppliers of machinery and other equipment. The relation with the customers is very important and this can be through agreements with wholesale dealer or direct sale to special distributors like delicatessen shops. This last type of relation is often looser than the first one.
- Some of the firms have informal networks with other firms in the same position and at the same level. These networks are often personal relations. These informal relations are also far the most important channels concerning the accumulation of knowledge and knowledge spillovers, besides the knowledge created from their own trial and error. Other important information and knowledge providers are competitors and especially the large companies in the sector, Tine and trade organisations when it comes to making cheese. The most important guidance is still the customers.
- The flow of information and knowledge when it comes to practical sides of the productions especially towards branch organizations or organizations like the Agricultural Extension Service (Landbrukets Forsøksring) or the agricultural department of the county governor (FMLA[398]) these are rather open. When it comes to providers of more systematic and advanced scientific knowledge, cooperation and network is more limited, but can contribute to overcome barriers, i.e. through confidence with larger production units or to be inspired to think new. The large firms like Tine (milk) and Gilde (meat) are willing to cooperate with small niche producers, but they will do it their way. Anyway the lack of these kind of cooperation and networks result in that the production and processes to a large degree are maintained internally and not in cooperation with others.
- Contact with regional authorities is conducted via the agricultural department of the county governor (FMLA). The County Governor contributes to the implementation of national agriculture policies by information, distribution of state grants to farmers, and through locally adapted measures. The Governor co-operates in several fields with other regional state offices and local government. Encouraging new business based on farming are important fields of co-operation.
- The agricultural Extension Service (Landbrukets Forsøksring (LF)) is the most important system for local research and advisory service in crop production and farm economics. Anyone running a farm or horticultural business can become a member of the local extension group. An annual membership fee entitles you to a number of different advisory and experimental services. Most of the firms are connected to this organisation
- Surprisingly there is a poor cooperation and not formal networks between the agri-food sector and the tourism sector. The tourism is much more related to the fishery sector. There is great potential for such cooperation in Lofoten, especially when they now try to build up a branding company for agriculture products in Lofoten.

[398] FMLA is an acronym for the Norwegian name *Fylkesmannens landbruksavdeling,* meaning the agriculture division of the county governor.

Tourism

- Our perspective of the knowledge base and the related type of innovation activity we have emphasised is very much a question about networking and collaboration between the firm level and the policy level. Hence, the patterns of collaboration in the tourism industry represent an important part of the innovation conditions that the firms and suppliers depend on.
- Although many business people would like to focus on the fact that individuality and conflict are important features in the tourism industry in Lofoten, the history of collaboration is strong in Lofoten. The Lofoten council (Lofotrådet) gathers the municipality level, which has a record and attitude of consensus based collaboration.
- In the case of tourism the two perspectives we apply (”academic perspective on green/sustainable local community development” and ”value neutral policy process based on new tourism White book and consulting expertise”) collaboration is central and the two perspectives actually melt into each other on this point.
- Unlike most industrial activities the complete tourism industry is well-organised from the firm level and up to the policy level. The majority of tourism firms, the suppliers of accommodation, food, activities, attractions etc. have membership in Destination Lofoten, which is the biggest and official representative for tourism.
- The firms that do not have membership in Destination Lofoten have membership in a couple of more local tourism boards (for example west in Lofoten). The membership and its fee give mandate and financial freedom for Destination Lofoten to run the described development process with the policy level. The process includes the national/regional policy maker Innovation Norway as well as selected key representatives from the industry, for example transport and communication actors and the largest tourist attractions and activities. Between the top level of this collaboration, where Destination Lofoten and the Lofoten Council are located, each municipalities have separate activities run by local tourist boards and the like.

Manufacturing

- A formalized network organized at the national and regional level (ARENA) has members in Lofoten among emerging cod producers. This network is promoting codified – codified relations, mostly between industrialists and the regional university in Bodø.
- Networks in Lofoten on an informal basis, where practitioners exchange information and experiences with cod production
- The Lofilab national and international networks on cod fry production include national cod producers, financiers, and the national innovation system.

Innovation conditions

Agri-food in Lofoten

- In Norway, nationally and at a local level the Government has an important role as a driving power by creating economic room for activities where different actors can interact in the development of innovations.

- Despite this there has so far been rather little attention to the role of innovation in economic development of traditional and mature industries, like agriculture in rural and peripheral regions and specially the integration of these industries in national systems of innovation.
- The Government has recently realized a plan, which sketches some principles that need to be fulfilled in order to implement a horizontal innovation policy, also concerning the agriculture sector[399]. The plan has ambitious objectives for innovation as one of the most important criteria for value creation in Norway also for agri-food production. So far there has not come any concrete out of this for the agriculture sector.
- An important actor, which promotes nationwide industrial development profitable to both the business economy and Norway's national economy, and helps release the potential of different districts and regions by contributing towards innovation, internationalization and promotion, is Innovation Norway. They administer the so called Local Developments Funds (Bygdeutviklingsmidler) together with FMLA, which is one the few regional policy instruments arranged for the agriculture sector and innovation. The firms that have received support from the Local Developments Funds are very pleased with this arrangement.
- Other firms in this case study emphasize that the Government do not arrange for a good policy concerning innovation and industrial and commercial development. This is connected to public bureaucracy and regulations, which they mean complicate the production and is time consuming in the daily work. They are also not satisfied with the guidance from agricultural department of the county governor (FMLA).
- Overall we can say there is lack of local policy attention and local policy help concerning innovation and this is an important observation when we compare the cases in Lofoten. Why is not the most important municipality (Vestvågøy) concerned with innovation in agriculture in the same manner as with tourism for example?

Tourism in Lofoten

- The network of the tourism industry described above gives mandate to and enables the larger policy process and the development of different perspectives to development of the tourism industry. But the collaborative structure does not currently provide direct support to innovation activities on the firm level.
- Smaller and larger tourism firms rely on the opportunities given by Innovation Norway – the Norwegian national innovation policy and the related regional policy.
- The largest and most competent actors (a site-museum for example) are able to exploit the European framework programmes for collaborative research and innovation. Tourism is a priority area in Innovation Norway both nationally and regionally, but there are no customised innovation policy programmes that aim at supporting tourism firms and their specific needs in particular. The possibility for support to firms is given by Innovation Norway's general measures, mainly loans and subsidy to investment in fixed assets.

[399] 'From idea to value creation' (Fra ide til Verdi), NHD 2003

Manufacturing

- The innovation process is extremely complex and risky.
- It involves combinations of science based, craft based and tacit knowledge, and heavily relies upon cumulative, long term learning and experience
- The challenge is to maintain continuity in this process, given the loosely coupled and marginalized character of the regional network actors.
- So far, this has been possible through support from private investors, potential customers and Innovation Norway

Final conclusion:

Peripheral Innovation Systems in Lofoten?

The innovation system in Lofoten takes different configurations depending on the industrial domain and sector in question. In the domain of tourism we can actually observe a regional innovation system in the sense that there is a process of development by networking going on. The Master plan process includes most important stakeholders at the local and regional policy level and it includes many of the most important industrial players in the tourism industry. The direction out of this process in terms of impact into innovation remains to be seen. The observed innovation system seems to represent good innovation conditions for the branding of the industry as a whole. It will hopefully construct good innovation conditions for firms as well, even though the current link from the Master plan and down to the firm level seems weak.

In the domain of the agri-food industry the system dimension is weak. As we see it there is not such a local innovation system in this sector in Lofoten. The firms and the supporting actors are too fragmented missing good cooperation and networks. The firms are also pretty small and have too few resources, when it comes to education and manpower.

Our last case is the manufacturing industry in the domain of aquaculture and cod fry production. This sector has clear innovation system features locally/regionally, and the system is linked to the national system. While the local/regional system learns from interactive learning between codified and practical knowledge, there is need for stronger emphasis on interactive learning in national level innovation policy (the linear science-driven model has failed). There exists a formalized network organized at the national and regional level (ARENA), which has members in Lofoten among emerging cod producers. The network is promoting codified – codified relations, mostly between industrialists and the regional university in Bodø. There are also networks in Lofoten on an informal basis, where practitioners exchange information and experiences with cod production. The Lofilab national and international networks on cod fry production include national cod producers, financiers, and the national innovation system.

5.7 Summary

Lofoten is the archipelago to the west in the ocean, north of the Arctic Circle, at the 67th and 68th degree parallels. Lofoten consists of 7 principal islands and 6 municipalities. The total land area amounts to 1,227 sq. km. About 24,500 people live there. The road distance is almost 170 km from northeast to southwest. Lofoten stretches like a wall of mountains to the southwest in the sea consisting of mountains and peaks, wide open ocean, sheltered inlets, stretches of seashore and large virgin areas. Industrial activity is dominated by fisheries, agriculture, tourism and public service.

Is there a Lofoten specific peripheral innovation system supporting development and innovation in the three industrial domains we have studied? Industrial activity in the region of Lofoten in Norway is generally characterized by the strong consciousness of identity that is typical for the Lofoten community. Generalised the result shows that the region and its local specificities are important in industrial development and innovation, although to a varying extent when we look at the selected industries. Local/regional factors are most evident and significant in the case of the tourism industry. The tourism product is basically the identity of Lofoten and the Lofoten way of life. Local/regional factors are evident to a more varying extent in the case of agri-food production. We have identified innovative Lofoten brand based niche products, but the agri-food industry is still dominated by traditional meat and dairy production. In the case of manufacturing (aquaculture), the name of Lofoten has a symbolic significance, as the breeding ground of the Norwegian Arctic Cod. The aquaculture innovation system, however, is national. On a general level we may conclude that there is an operational locally/regionally based innovation system in the tourism industry, in the agri-food sector the system is not fully developed into a peripheral innovation system, and the manufacturing case provides us with an example of locally based key knowledge and competence components, but the supporting innovation system exists in the national context.

Adding more details to this overall picture the study have emphasized the knowledge and competence base, innovation activity, co-operation and networks, and innovation conditions in each case.

The **knowledge and competence base** in the tourism industry is in the process of being updated and strengthened at the industry and policy level. Representing the majority of the industrial actors this policy and innovation process is operated by a coordinating industrial actor (Destination Lofoten) that has intimate networks into the policy level, which includes the six municipalities in Lofoten, their collaborative agency and the regional/national innovation policy agency. The process exploits national consultant expertise in this process but it is a crucial unanswered question whether and how the knowledge and competence from this process is to be diffused and exploited at the firm level. In aquaculture (manufacturing) the knowledge base is systemic, in the sense that firms and people through their careers are combining different skills and forms of knowledge (science based, tacit and sticky).

In terms of **innovation activity** our investigation shows that the firm level of the tourism industry is full of good examples, ranging from radical innovation and entrepreneurship to incremental innovation and imitation. As indicated above there is reason to ask whether the identified policy innovation process will have consequences for innovation at the firm level.

Manufacturing is serving a highly innovative industry, facing both technological and market challenges. The pressure for new innovations is hard.

The topic **cooperation and networks** is basically one of the main findings in the tourism case of Lofoten. The destination company operates an extensive network of tourism firms and the network involving policy actors is well maintained as well. Altogether the network actor Destination Lofoten is the main node of the policy innovation process in tourism and of what we could call the peripheral innovation system of tourism in Lofoten. In manufacturing, the networks are national and linked to the research and science base. Local networks exist but are of weaker significance.

Also when it comes to **innovation conditions** it is the policy innovation process in the tourism industry, led by Destination Lofoten that provides the findings. The policy innovation process includes all significant, existing policy actors, including the local municipalities, their collaborative agency, the Norwegian national and regional innovation policy agency Innovation Norway, and a national business service provider/consultant specialised at innovation in tourism.

The innovation conditions in manufacturing are characterized by competing interests and conflicting strategies in the national innovation system. Within this context, the Lofilab strategy is marginalized. The sector has clear innovation system features locally/regionally, and the system is linked to the national system. While the local/regional system learns from interactive learning between codified and practical knowledge, there is need for stronger emphasis on interactive learning in national level innovation policy (the linear science-driven model has failed). There exists a formalized network organized at the national and regional level (ARENA), which has members in Lofoten among emerging cod producers. The network is promoting codified – codified relations, mostly between industrialists and the regional university in Bodø. There are also networks in Lofoten on an informal basis, where practitioners exchange information and experiences with cod production. The Lofilab national and international networks on cod fry production include national cod producers, financiers, and the national innovation system.

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Appendix

Few facts on agri-food industry (milk, dairy and meat) in Norway

Table 0-1: Production average unit size

Milk	15 cows
Sheep meat	54 sheep
Pigs for breeding	34 pigs
Pigs for slaughtering*	480 pigs
Eggs	2323 hens**

*Yearly delivery, units delivering below 100 pigs excluded.
**Units below 100 hens excluded.
Source: Ministry of Agriculture 2004

Table 0-2: Volumes and value of commodities produced in Norway representing nearly 90% of the value of produce from farmer and % of national consumption

Product	**Volume (in tonnes)**	**% of National consumption (1999)**	**Share of total farm income from the different productions (2000) %***
Milk	1559 mill liters	99 %	32.4
Beef meat	90	97 % total meat	32.1 (total meat)
Sheep/lamb meat	23		
Pig meat	102		
Chicken meat	43		
Eggs	47	98 %	2.4
Cereals	1351		12
Cereals for food	124 (1999)	36 %	
Potatoes	380	83 %	2.1
Vegetables	161	58 %	7.5(including fruit and berries)
Fruit and berries	71	18 %	
Sugar and honey	1.25	3 %	
Fat and oils		20 %	

*Based on value of produce from farmer + support for produced quantity
Source: Ministry of Agriculture 2004

Figure 0-1: Holdings by size of agricultural area in use, Size classes. Decares, Norway

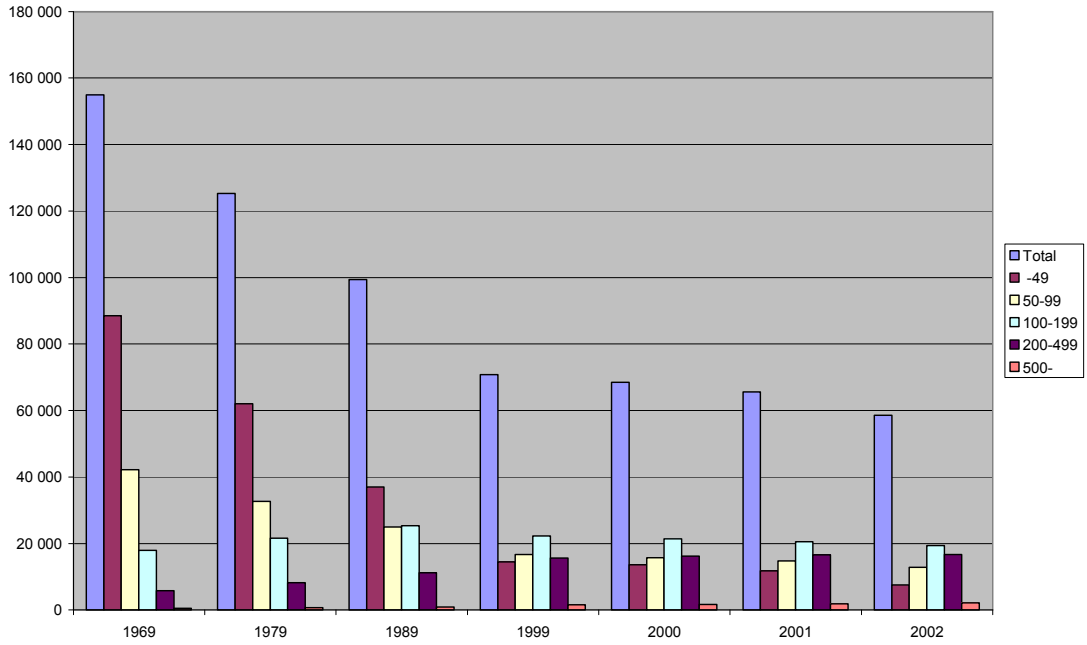


Figure 0-2: Development of domestic animals, Norway

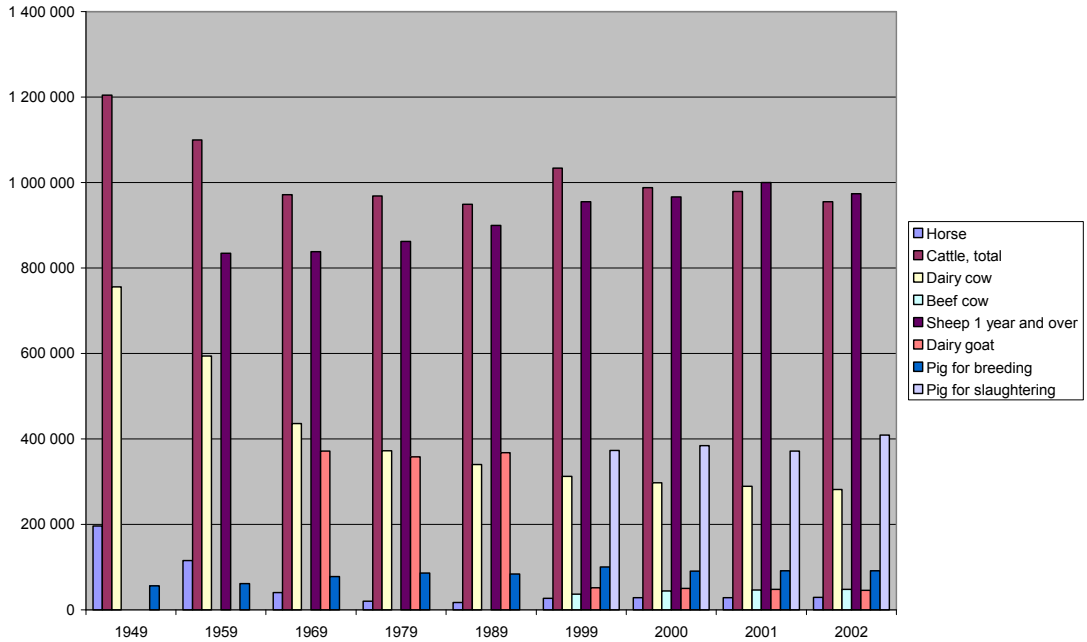


Figure 0-3: Holdings with dairy cows, by size of herd, Norway (1962-2002)

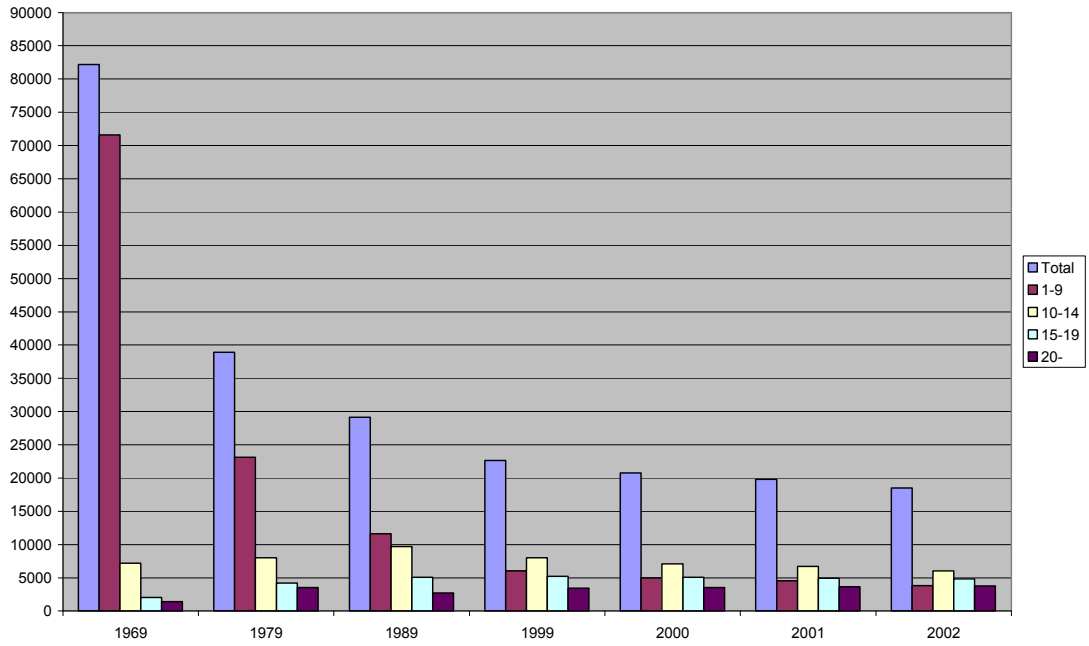
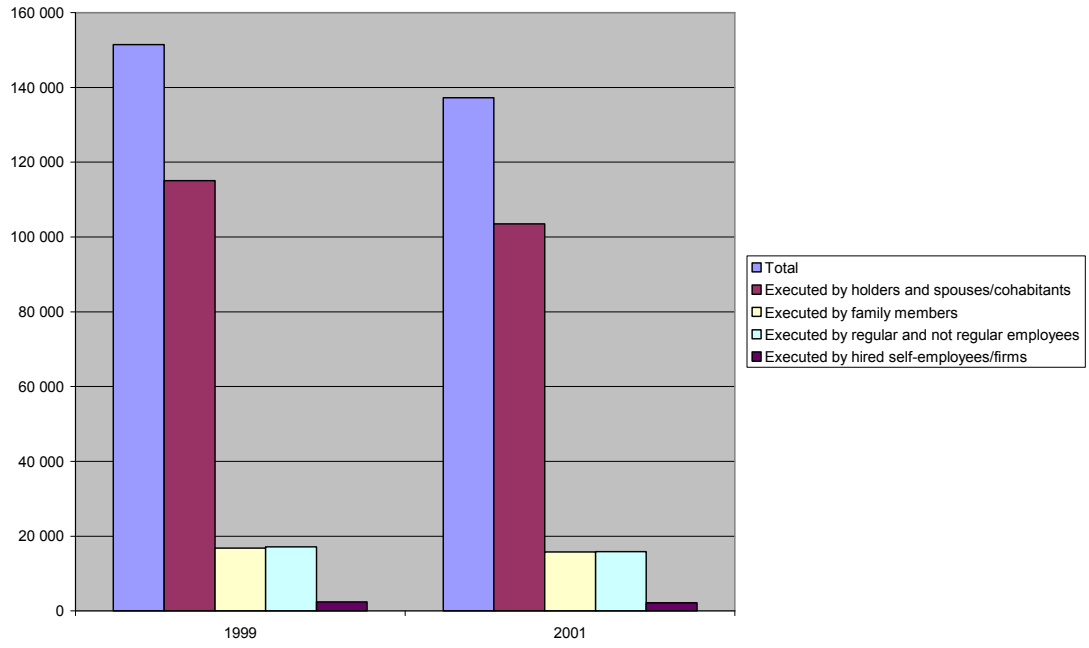


Figure 0-4: Labour input on holdings by category of manpower. Norway, 1999 and 2001 (1000 man-hours)



Few facts on agri-food industry in the Lofoten region

Figure 0-5: Number of milk cows and production volume.

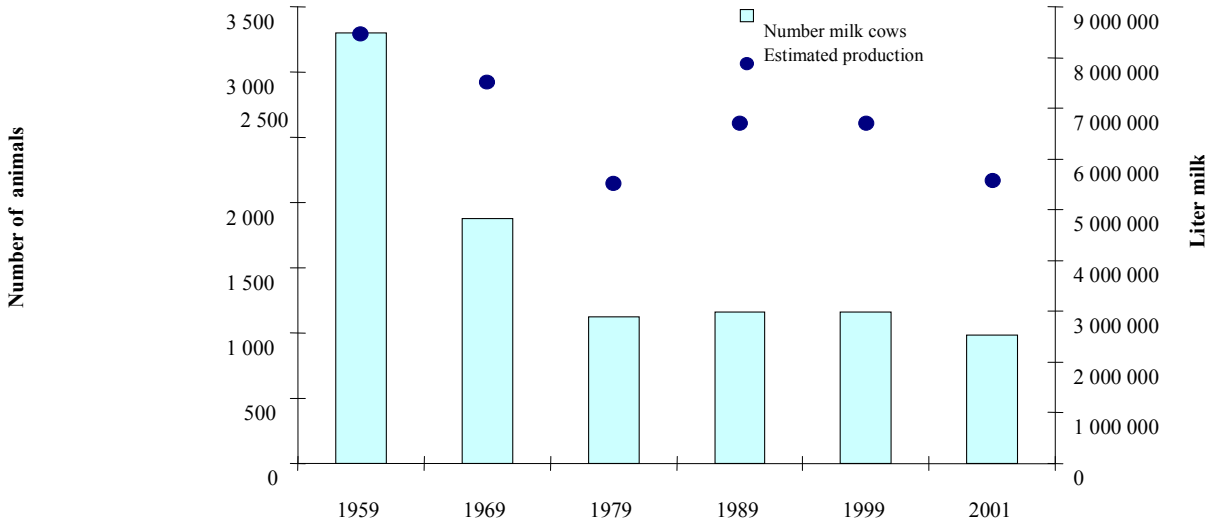


Figure 0-6: Development in number of milk cows per farm and number of farms

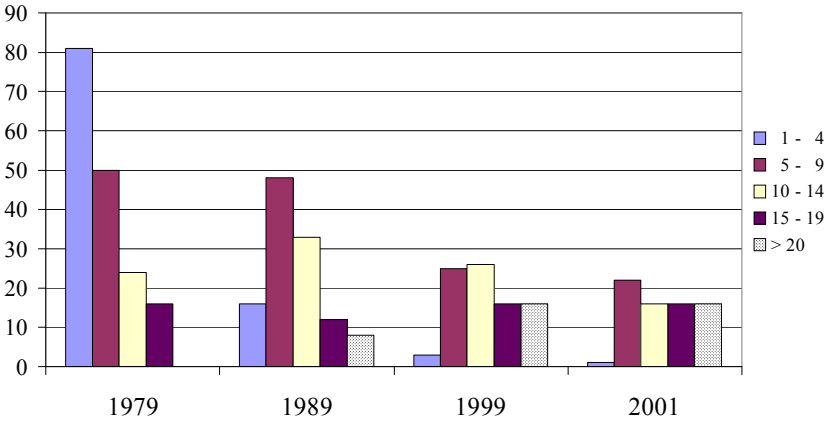
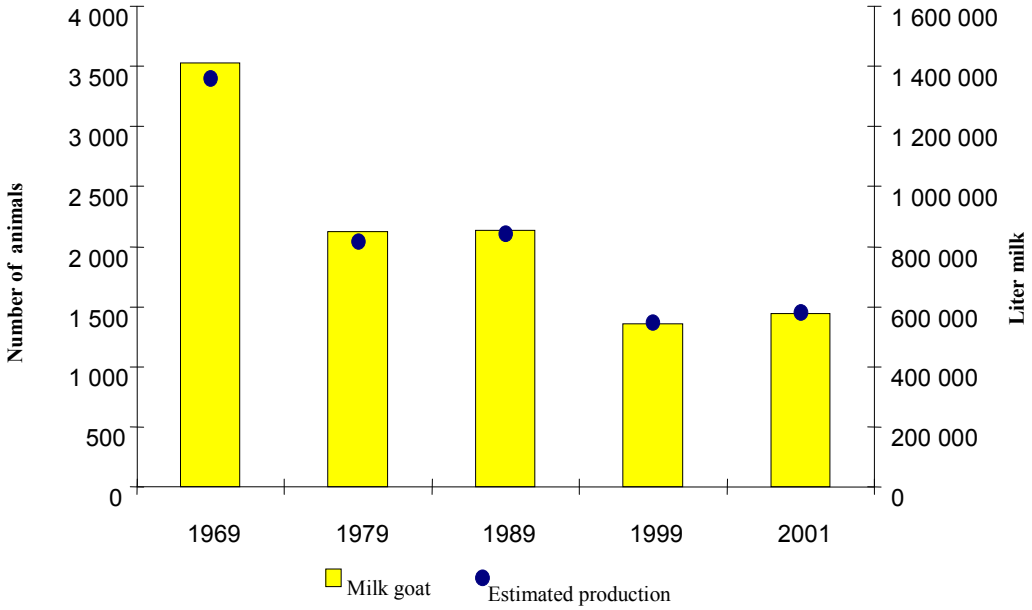


Figure 0-7: Number of milk goats and production volume



CHAPTER 6: Case studies from Sweden

6.1 Selected issues in policy and institutional initiatives in Sweden

6.1.1 Innovation policy

The project of Innovation Systems and the Periphery (ISP) has a focus on three sectors studied in a specific regional context. Information is gathered by studies of policy documents, earlier research and by empirical data collection in semi structured interviews with actors in the region. Hence, there are some aspects of the innovation system approach that are relevant to discuss in the context of the project. The project has a sectoral and regional perspective although not limiting the scope of the study to interaction within the sector and region. The literature on innovation systems focuses on different system levels of analysis: technological, sectoral, regional, national etc. The different theoretical approaches to innovation systems address the importance of knowledge flows between different actors and stakeholders in the system (Freeman 1987; Lundvall 1992; Nelson 1993; Edquist 1997;). The approaches are often described to have a have a complementary character where some of the perspectives have a stronger focus on geographical aspects of the innovation system (Fischer et al. 2001). Other related approaches are competence blocs that are addressing branch or product level (Eliasson 2000 and 2003). The industrial *cluster* approach study the performance of industrial sectors and emphasize environmental conditions and inter-industry interactions in creating dynamic clusters (Smith 1995). Recent Swedish policy has had the cluster approach as one (of several) approaches to also promote regional development (SNS 2001) for stimulating a development also outside the metropolitan regions. The creation of a Swedish agency for innovation systems (Vinnova) and government investigations stress the importance of understanding the conditions for innovation as a source for productivity, growth and prosperity in Sweden. Current innovation policy (Ds 2004) stress the importance of building an innovative capacity by focusing on four priority areas: knowledge base for innovation, innovative trade and industry, innovative public investment, and innovative people. In describing the scope of innovation activities, the following definition is applied in the ISP-project:

An innovation means implementing a novelty for the purpose of strengthening or improving the competitive status of the entity (firm) in question. Example of this is when a firm introduces a new or significantly improved product (good or service) to the market, or when a firm designs or utilizes a new or significantly improved process or method. Innovation is based on the results of new technological development, new combinations of existing technology or knowledge, or utilization of other knowledge acquired by the firm. Innovation is defined from the perspective of each firm, i.e. it has to be new to the firm; but not necessarily to the market (locally, nationally or in an even wider context). It does, therefore, not matter whether the novelty was developed by the firm or by another entity.

Regional systems of innovation underline the importance of processes of both globalization and regionalisation of knowledge creation and learning and also the importance of knowledge spillovers and transfer of tacit knowledge (Fisher et al. 2001). The approach of innovation systems emphasises that, "the economic performance of territories (regions or countries) depends not only on how business corporations perform, but also on how they interact with each others and with the public sector in knowledge creation and dissemination (Fisher et al.

2001, p. 8). The role of regional administration and research and development budget is also stressed in connection to existence and development of regional innovation systems (Cooke et al 1997).

6.1.2 Rural development policy

Rural Development Programme[400]

The RDP is part of the Common Agricultural Policy and usually mentioned as Pillar 2 of CAP. Pillar 1 is the market price support scheme for crop and livestock products and compenatory payments to farmers.

RDP aims at supporting sustainable - ecologic, economic and social - development in rural areas.. Investment support is provided to constructions on farms which contribute to improved environment for animals and for work, for increasing competitiveness and for complimentary activities. The latter could be building facilities for processing or marketing of farm produce, machinery for wood processing, horse keeping and tourism.

The RDP also provides support for multiple activities at farms, rural tourism, and village development aiming at prudent maintenance of cultural and natural assets. The measure includes restoring of idle grass land and wetlands.

Farmers and farmers associations can get support för competence building, study trips, courses etc. These measures are coordinated with EU's Objective 3 funded by European Social Fund (ESF). RDP in Sweden also supports a small programme for local action groups – Sustainable villages (Hållbara bygder). The programme is co-ordinated by the nation-wide Popular Movements Council (Folkrörelserådet Hela Sverige ska leva).

Objective 1 and 2 in some parts of the country (Se map in section 2.4.1) provide support for projects aiming at increased attractivity for staying in and inmigration to rural areas, e g local service plans, social economy including cooperatives, networks, information and place marketing.

Rural support to business firms

This national programme aims at stimulating investments in enterprises in rural areas. Support is granted to:

- Investments in SME which are considered to become profitable and provide sustainable employment
- Buildings or constructions for durable use
- Machinery and equipment, excl vehicles
- Product development and marketing, e g consultation costs.

[400] "Rural Power" – overview of support for rural development in Dalarna (Source: LandsbygdsKRAFT, Länsstyrelsen)

Leader +

EU's programme for rural development aims at from local conditions and initiatives support new and innovative methods for renewal of rural areas. 12 Leader areas are appointed in Sweden, one is partly located in Dalarna (Nedre Dalälven, Lower Dal River). Eligible projects should be locally anchored, have a bottom-up perspective, be considerably innovative and create networks and new ways of cooperation. Support is only given to associations or community groups, not individuals.

Regional Project Funds

Matching national funding of EU-programmes and the regional Growth Programme.

Objective 1 South Forest Region

The aim of the European Structural Fund programme in Objective 1 is to promote the development and structural adaptability in areas that are lagging behind in development (NUTEK 2004a).) Five municipalities in north-western Dalarna are covered by the programme. The vision of the Objective 1 Södra Skogslänsregionen programme is the achievement of a growing business life and entrepreneurship, and the development of the region's already favourable living environment in order to attract new people.

The priority areas below have been drawn up, each with a target vision.

1. Development of trade and industry – strengthened, diversified and innovative business life.

2. Life long learning and development of human resources in work life

3. The development of agriculture and forestry, development of the rural areas and of the fisheries industry – strengthening the competitiveness of the countryside and sparsely populated areas and promoting a long term sustainable development.

4. Development of living environments and infrastructure – strengthened regional and local attraction power to attain improved accessibility.

The measures taken within these areas will, during the programme period, contribute to 8 000 new and maintained jobs, create 1 000 new enterprises and offer education to 20 000 persons in 2 000 companies.

Objective 2 North Sweden

Objective 2 Norra include 31 municipalities in the counties of Dalarna, Västmanland and Gävleborg (NUTEK 2004b).The budget of Objective 2 Norra comprise close to SEK 1.6 billion in EU funds. The overall aim of Objective 2 Norra is for the programme to create potential for the development of trade and industry, as well as competitiveness by way of increasing the knowledge provision of the area. An additional aim is to increase the number of gainfully employed persons and the number of people employed in the service sector and to increase the share of people with post secondary school education. With this in mind, two priority areas have been drawn up:

• *Development of trade and industry.* Company development and the creation of potentials for a prospering business climate are emphasised. Big companies in traditional lines of business provide a basis. Small and middle sized companies are necessary to increase the employment

rate and for business renewal. Outof the funding for the development of industry and trade, one fourth will be used to support new enterprises.

• *Knowledge-driven development.* The three university colleges in the region are important assets to this priority area. The objective is to increase the share of post secondary school education among both men and women.

6.1.3 Linkages between innovation policy and development policy

There are a set of links between the regional development policy and innovation policy that we want to highlight here in the context of the Swedish study of Dalarna. In Sweden the policy areas of innovation and regional development and growth have merged in the sense that innovation studies are carried out in a local and regional context and also that public agencies concerned with growth policy issues, such as the Swedish institute for growth policy, have taken an interest in innovation issues. Issues raised in these studies are for example: What is the role of institutions such as municipalities in an innovation context? Which are the actors in the innovation system in different regions? However the answers to these questions will be strongly influenced by which approach and method of investigation that is applied.

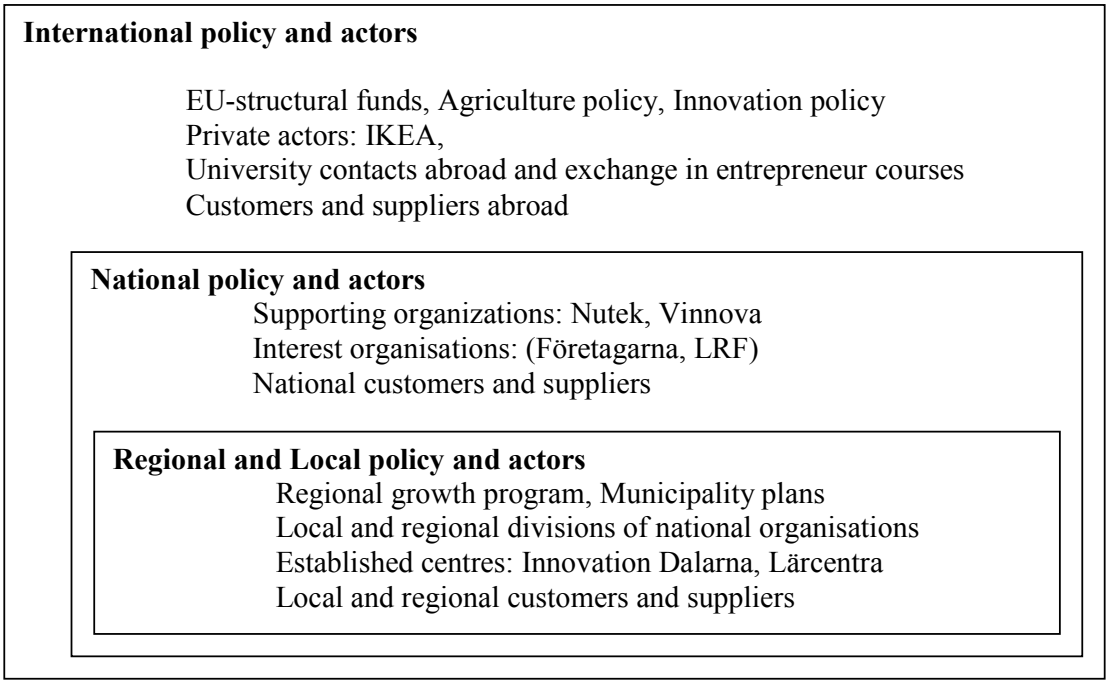


Figure 1. Actors and levels of interaction for the individual entrepreneur and innovator

A study addressing the former question is focusing on conditions for innovation in municipalities located in the (extreme) Nordic periphery (Nordregio 2004). One difference in the approach applied in that project, compared to the ISP-study, is that the innovation processes studied relates to business field innovations, public sphere innovations, and civic society innovations. Compared to that study the ISP-project has a stronger sectoral focus mainly focusing on introduction of novelties in the business sector, although public actors are often involved. A recent study from Swedish Institute for Growth policy (ITPS A2004:020) mapped 405 actors in the Swedish innovation system. The ITPS study had a national focus

and used a set of key terms for activities of which the organisations considered themselves to work with (innovation, entrepreneur, commercialisation, business development, venture capital, seed capital, patents, start-up, and business renewal/development). Hence, the organisations listed are mainly supporting organisations. Nine of these actors were identified in Dalarna, of which two were included in the ISP-study. Rather than focusing on public actors and supporting organisations, the firms and their views on conditions for innovation is in focus. Three points are made in the following section to outline the research context of the ISP-project compared to the two earlier mentioned studies.

First, the ISP-study sectoral focus (food industry, tourism and light scale manufacturing) and thereby acknowledges the rich set of actors central to the creation of networks and innovation processes within and between the three sectors. Secondly, the regional actors in the ISP-context are focusing on the companies active in the three sectors, but including the public actors in the study to learn more about the 'innovation policy landscape'. Thirdly, the regional and innovation system have important links also outside the region since the companies in the region of Dalarna naturally also interact with actors and policy frameworks outside the region. In the case of Dalarna the EU-programmes and structural funds are also interacting with regional growth programs. In addition to this interaction at the policy level, the individual entrepreneur and firm also have their national and international networks with suppliers, customers and personal contacts. One general remark about different *modes of innovation* is that the regional development policy programmes (including rural development policy) have recognized the importance of innovations at three levels. First, that innovations and renewal are essential at the level of the *firm* (product and process innovations), but also that modes of innovation also includes *inter-organizational* innovations (new ways of interacting) between the firms. Thirdly, the aims of the programmes also recognize the importance of innovative methods at the *policy level*. In connection to the latter level, the issue of policy-learning (i.e. transfer and adaptation of policy from one policy area to another) is important, although it is not mentioned explicitly.

The study in Dalarna defines innovation in lines with the definition applied in the Community innovation survey (CIS), as a new or significantly improved *product* (good or service) introduced to the market or the introduction within your enterprise of a new or significantly improved *process*. The innovation is based on the results of new technological developments, new combinations of existing technology or utilisation of other knowledge acquired by your enterprise (EC/Eurostat 2004). Further on, the CIS elaborates on the scope of product and process innovations.

Product innovation is a good or service, which is either new or significantly improved with respect to its fundamental characteristics, technical specifications, incorporated software or other immaterial components, intended uses, or user friendliness. The innovation should be new to your enterprise; it has not necessarily to be new to the market. It does not matter whether the innovation was developed by your enterprise or by another enterprise. Changes of a solely aesthetically nature, and purely selling of innovations wholly produced and developed by other enterprises, shall not be included.

Process innovation includes new and significantly improved production technology, new and significantly improved methods of supplying services and of delivering products. The outcome should be significant with respect to the level of output, quality of products

(goods/services) or costs of production and distribution. The innovation should be new to your enterprise; your enterprise has not necessarily to be the first to introduce this process. It does not matter whether the innovation was developed by your enterprise or by another enterprise. Purely organisational or managerial changes shall not be included.

The literature addressing different dimensions of innovations addresses the distinction between types of innovation in asking the straightforward question 'what is changed?' and what type of novelty that is introduced (Tidd et al. 2001: 7-8). Relating to the two sectors studied in the case of Dalarna new process innovations can be to introduce the novelty of on-line tourist booking systems or for the food processing industry to introduce change the production process. Often the product innovations are linked to process innovations, i.e. manufacturing a new type of product requires changes also in the production process. Also in the results from the third CIS about 50% of the firms that innovate are both product and process innovators (EC/Eurostat 2004:19).

6.1.4 The official framework for rural business services and innovation facilitation

Regional Growth Programme

The Swedish government introduced a new element of industrial policy in a bill on regional policy in the beginning of 1998. Swedish regions were invited to design and negotiate regional growth agreements (RGAs) with the Ministry of Industry, Employment and Communications. In the beginning of year 2000, all the 21 political-administrative regions handled their RGAs to the central government.

Bo Svensson (in Persson, Sätre-Åhlander and Westlund, eds. 2003) has analyzed the RGA initiative from a rural development perspective. Svensson claims several reasons for doing this. First, even though the RGA process has dominated economic development activity in the regions the last couple of years, rural development issues were clearly peripheral to the initiative.[401] Second, there is reason to wonder whether the partnership-based processes allow rural areas and their representation into the process. Third, the strong emphasis on business involvement in the process might prove problematic to rural areas where most enterprises are bound to be fewer and smaller than in other settings.

Scholars dealing with regional development activity often emphasise the importance of close and substantial public-private relations as a vital component in releasing the dynamics of regionalisation. A certain mobilisation is often envisaged as part of the package, where improvement of the region's economic performance and competitiveness bring together political and economic interests into territorially based alliances (cf. Keating, 1998). Within this field of research, prospects for mobilisation often are conceived of as linked to the political and economic characteristics of the region, suggesting that politically strong and economically prosperous regions would have more to gain from mobilisation than regions that are poor in this respect. According to this view, a vulnerable socio-economic base limits a region's political options, which is why public actors in lagging regions tend to take on defensive rather than offensive strategies. Also private organisations in such regions may be slower to realise the 'business' of regional mobilisation, further explaining why it seldom

[401] The RGA process is a continuous regional development process that during 2002 entered a new phase under a slightly different name, i.e. regional development programmes.

takes place in such areas. If this rather deterministic and static view is taken all the way, it would always be possible to predict whether or not regional mobilisation will occur in a certain area and whether it would bring advantages or not.

According to Svensson (op cit) the same line of reasoning may be applied at the local level, i.e. the dynamics of public-private collaboration are more obvious in politically and economically strong communities. According to this logic, public-private dynamics are not only less likely to come about in rural areas; they are also less likely to bring advantages in such areas. Svensson questions this notion and discusses under what circumstances it may prove wrong. The view adopted is that the scope and potential of public-private resource mobilisation may be just as great in settings where resources are limited, and that such mobilisation may make an ever bigger difference in such areas. The logic here is simple. If resources are scarce, the need for mobilisation and pooling of resources increases.

Such a view finds some support in rural development research, where the emergence of partnerships in rural areas has been noticed in many countries for some time now. It is also clear that the voluntary sector usually stand out as important in this context. In an early study of rural partnerships, one conclusion is that partnerships emerge in an initiative vacuum (cf. Westholm, Moseley & Stenlås, 1999).

What are then the key characteristics of the RGA initiative and why is it reasonable to suspect rural areas might find it problematic for their chances of making their voice heard in the processing of programmes? First of all, the task of co-ordinating the RGA processes was given to the county administrative boards (*länsstyrelser*) and their equivalents in four regions experimenting with new forms of government. Although introduced by the central government, the RGAs should be based on priorities and measures as developed by broad partnerships in the regions and formulated into coherent regional programmes. Programme contents should thereafter be evaluated by, and "negotiated" with, the central government before coming into realisation. The regions approached the programming process in different ways, and also interpreted the partnership idea differently, even if the central directives applied to all (cf. Östhol & Svensson, 2002). One particular and potentially innovative feature of the initiative was the strong emphasis put on the involvement of private business in order to make sure that the needs of business were at the core of agreements. Quote: "The participation of the private business community is considered to be a prerequisite for the success of the programmes. Regional public actors are encouraged to enter into discussions with representatives of local and regional business communities to ensure that their views and needs are integrated into the action programmes."[402]

The strong emphasis on business interest involvement through partnerships seems to imply a will on part of the central government to better match the public and the private sphere in the regions. Bringing business interests into closer contact with the public administration and political representation is apparently believed to be fundamental for pooling resources earmarked for regional economic and industrial development, in this case the promotion of centrally defined policy goals.

[402] Ministry of Industry – *Regional industrial policy and agreements for the promotion of regional growth*.

No additional financial resources were provided for the purpose, rather the intention was to improve and better co-ordinate the use of already existing resources within industrial, regional and labour market policy. Through RGAs, the government wants to achieve greater integration between policy areas and adopt a regional outlook on the utilisation of those means that regions already benefit from through sector-specific public support.

A certain regionalisation of industrial policy has been discernible before in Sweden, but not as explicit as now. Neither has the emphasis on broad partnerships as its basis and the wish for bottom-up mobilisation been as explicit from the central level of government before. These features, however, does not guarantee that rural development issues or rural interests have a position in regional growth strategies and there are features of the RGA initiative that can be interpreted as indicating the opposite. These are:

- *Organisation/ leadership:* Responsibility for running RGA processes was (except for a few cases) given to county administrative boards, i.e. the regional level of the state. To local level representatives, in municipalities, village action groups or even SMEs in the periphery, that means control and power is still far away.
- *Growth focus*: The strong emphasis on economic growth indicates a narrowing down of broader understandings of regional development in favour of more strictly business-related matters. Given the mainstream ideas of economic growth thinking, with its focus on industrial clusters and innovative systems, rural areas seem less likely to be at the core of strategies.
- *Business participation*: Strong business involvement was more or less considered a prerequisite for success, as mentioned above. Business Interest Associations (BIAs) as well as larger firms can be expected to be concentrated in regional centres, further underlining the risk of rather centralised regional strategies.

One might quite correctly argue that the RGA initiative is not about rural development and that future economic growth is not to be found primarily in rural areas, but rather assumed to take place in urban areas. Nevertheless, all rural areas are not doomed to be hopelessly backward in economic development terms. It is therefore reason to wonder to what extent the RGA processes in Swedish regions take rural development issues into consideration, create opportunities for actors also in rural areas and leave room in the programs for rural initiatives.

Rural issues in RGA – an overview

Before turning more explicitly to rural aspects of the process, a general characterisation of RGA programming serves to illustrate what work has been like.[403]

So far, the perhaps most apparent positive result of the RGA initiative seems to be the co-operation processes it created in the regions. The focus on growth, issue linkages and sector co-ordination stimulated regional mobilization in unprecedented scale. That is not to say RGA processes were smooth and conflict-free, but in most cases they were perceived of as something new in the context of regional development work. In general, co-operation among public bodies improved, as well as their awareness of business needs. In evaluations,

[403] The findings presented initially in this section are drawn from an evaluation of the RGA negotiation process in seven regions and at the national level (cf. *Regionala tillväxtavtal. Utvärdering av förhandlingsprocessen i sju län och på central nivå*).

respondents often described work as a learning process under way, which is in line with the intentions and rhetoric of the central government initiative.

Even though the process and its dynamic seems new, doubts are expressed whether it leads to very much in terms of new measures, actions, and eventually economic growth. As mentioned earlier, there were no new financial resources in the system, but the emphasis on economic growth in combination with greater flexibility in the usage of existing resources was supposed to support innovation in the system. As processing has moved into financing negotiations, the confusion over resources has been obvious and also created a sense of disappointment on many hands, despite the fact that no promises about new money was ever made. The most likely explanation for this is that existing resources were not as flexible as was presumed at the outset, which left little room for re-orientations in the usage of financial resources. Yet other aspects of the partnership-based process were that priorities were hard to arrive at due to the many voices of the process and also that accountability aspects were notoriously unclear.

It was obvious that the business involvement varied greatly between regions, but that it often remained low. In general there was a strong reluctance among the traditionally dominating actors within the field of regional development to let go of initiative and resources to new participants in the process, or new actor constellations, also in regions where new actors were generously invited into the process.

When turning to the treatment of rural development issues in the RGAs the picture confirm initial fears. However, the picture is not completely dark. According to a study from the Popular Movements Council, almost a third of the regions have been said to let the rural perspective through.[404] The study does, however, take a rather narrow perspective on the matter since it recognises only regions that mention local or rural development, or social economy, as a priority of itself. If projects are derived from local or rural partnerships made up of, for example, local businesses in a rural area this is not registered as part of the rural perspective. Obviously, the detection of rural concerns in the RGA programmes requires a rather careful reading and documents and probably also interview studies in the regions.

6.2 The research context: setting the scene

6.2.1 Agriculture and food processing in Sweden[405]

In terms of area, Sweden is one of the largest countries in Europe. About half of its land area is covered by forest. More than one third of the country is mountains, lakes and marshes. Less than a tenth of Sweden's total area– slightly less than 3 million hectares (nearly 7.5 million acres) – is under cultivation. Sweden has relatively favorable climate, considering its northerly location. However, the scale of agriculture varies greatly between the northern and southern parts of the country. The most extensive agricultural activity is found in central and southern Sweden. The growing season in the far south is 240 days per year, while in the far north it is less than 120 days. The climate in central and southern Sweden is temperate. Annual precipitation averages 600 mm (23.6 inches). The food processing industry is found

[404] According to a study from the Popular Movements Council, these are Södermanland, Gotland, Kalmar, Örebro, Halland, Jämtland and Västernorrland (*Landsbygdsutveckling – Lokal utveckling – Social ekonomi. Lokala utvecklingsgruppers delaktighet i tillväxtavtalen*).

[405] www.si.se

all over Sweden, but is most heavily represented in rich agricultural areas and large population centers.

Agriculture

Sweden can never become a major exporter of agricultural raw materials, due to its limited arable area. It also has climatological disadvantages that limit the growing season and increase the costs of buildings and maintenance. In spite of this, Sweden has developed one of the foremost agricultural sectors in the European Union (EU). It has responded to market competition by means of efficient production, with high yields per cultivated unit and per animal, or by specializing in such fields as organic cultivation.

Structure

Structural changes in agriculture over the past several decades have resulted in fewer and larger farms with fewer employees. In 1950, the number of farms with more than 2 hectares (5 acres) of cultivated land was more than 280,000, but in 2002 the number had fallen to 71,000. The average area of cultivated land on these farms was 38 ha (94 acres) in 2002. A majority of farms are family-owned, with most work being performed by family members. Part-time farming, with income supplemented by other employment, has become increasingly common. Only 24,000 farms were full-time businesses in 2002: about 5,300 farms were large enough that to operate, they needed hired employees.

Part-time farms are not declining in number to the same extent as family farms. Since 1990, the very smallest enterprises, with less than 5 ha of arable land, have even become more numerous in the Lake Mälaren valley west of Stockholm. Since1998, their number has also increased in southern Sweden. In many cases, these small farms are tending to become a form of residence or a lifestyle; some people are looking for living alternatives outside cities and towns, for example to enable them to raise horses in their leisure time.

In Sweden, agriculture and forestry are often combined. No fewer than 74% of all farms also have timberland. The average farm has 47 ha (116 acres) of forest.

The number of people working in agriculture is steadily falling. Only 1.4% of the economically active population works in agriculture. The average age of farmers is high, with 61% older than 50 years (2002).

In many cases, structural changes have meant more specialized agriculture, with an emphasis on grain production, dairy farming or pig raising. Meanwhile farmers have invested large sums in new machinery, equipment and buildings. Accelerating the shift toward larger and fewer farms and fewer employees is the fact that the total revenue of the Swedish agricultural sector has remained at essentially the same level in krona terms over the past five years.

In 2003, the production value of agricultural goods totalled SEK 40.2 billion. Animal products accounted for 53% of this, of which milk represented more than one fourth of production value. Vegetable products represented 47% of production value, of which grains accounted for 18%, other crops – potatoes, sugar beets, oil-seeds etc. – for 29%. Direct payments from the EU, including area aid and animal premiums, represented about one fourth of production value.

Production

VEGETABLES The cultivated area in Sweden totalled about 2.7 million ha (6.7 million acres) in 2003, of which more than half was located in the plains of southern and central Sweden and about 40% in central and forested areas outside Norrland. Only about 10% of arable land is located in Norrland, which comprises roughly the northern three fifths of Sweden. Västra Götaland County in western Sweden and Skåne County in the far south had the largest acreage of arable land. Of total arable land, farms with more than 50 ha (123 acres) accounted for more than 1.8 million ha or 66%. The average for the whole country was 37.8 ha (93.5 acres) per farm. The conditions for crop production vary greatly between northern and southern Sweden due to differences in physical features and climate.

Vegetable production is heavily dominated by grains, mainly barley, wheat and oats. More than 40% of acreage is used for such production. The production of cereals is concentrated in the plains of southern and central Sweden. The proportion of feed grains – barley and oats – increases further north and dominates cultivated acreage in Norrland. Barley is often used as feed for pigs and cattle. Oilseeds are grown mainly in the plains of Götaland (southern Sweden) and Svealand (central Sweden). Potatoes are grown throughout the country, but yield per hectare varies considerably between north and south. Sugar beets are grown only in the south, mainly in Skåne.

Yield per hectare varies considerably between different regions – in 2003 from an average yield of 5,750 kg (12,673 lb) of barley per hectare in Skåne to 2,430 kg/ha (5,356 lb) in northerly Norrbotten province.

HORTICULTURE Total outdoor acreage for production of garden plants has been largely unchanged in the past two decades, while the number of such farms with outdoor cultivation has continuously fallen. In 2002, their total outdoor cultivated area was 12,100 ha (29,900 acres), while the number of farms was 2.040. Average outdoor cultivated area per farm was 5.9 ha(14.6 acres). Vegetables, mainly carrots, iceberg lettuce and onions, occupied about 60% of the cultivated area, while fruits and berries, especially apples and strawberries, accounted for about 35% of this area in 2002.

Total greenhouse area for growing garden plants has also been largely unchanged in the past two decades, while the number of greenhouse cultivation enterprises has continuously fallen. In 2002, total greenhouse area was 3,370,000 squaremeters (36.3 million sq. ft.), while the number of farms was 1,140. Average greenhouse area per enterprise was about 3,000sq.m (32,300 sq.ft.). Greenhouse cultivation was dominated by tomatoes and cucumbers, which accounted for 80% of total area in 2002.

PRODUCTS OF ANIMAL ORIGIN In 2003, there were roughly 1.6 million head of cattle in Sweden, including nearly 403,000 dairy cows. Milk production totals 3.3 million metric tons per year, which is equal to the milk quota as signed to Sweden by the EU. The restructuring of milk production has cut the number of producers by more than half in the past ten years to 9,720 in 2003 and reduced the number of dairy cows by one fourth. The average number of dairy cows per enterprise was 41 in 2003. However, the smaller number of cows is largely offset by higher annual milk yield per cow, which in 2002 was 7,850 kg (17,300 lb), the highest yield among the EU countries. If the trend continues at the same pace, the number of

milk suppliers will fall by half and the number of dairy cows will decline by 100,000 within a decade.

In Sweden, milk production has played a pivotal role in agriculture, and beef production has been integrated with milk production. The decline in the number of dairy cows has created room for specialized beef cattle raising, in order to offset the resulting decline in beef production. The number of cows for beef production has consequently risen, totaling about 168,000 in 2003. Beef production that year amounted to 140,000 metric tons. However, beef consumption has increased faster than production, and Sweden thus has sizeable beef imports – about 42% of consumption in 2003. Swedish beef consumption has not been affected by the outbreaks of foot and mouth disease or of bovine spongiform encephalopathy (BSE), commonly called "mad cow disease," in recent years in other countries. Sweden is the only country in Europe that has not had any confirmed case of mad cow disease. Asa consequence of this and of the favorable price trend for beef, per capita beef consumption in Sweden is now at the same level as in France, i.e. the highest in the EU.

In the animal products sector, large specialized enterprises have arisen, mainly raising pigs and poultry. In Sweden there are 3,000 producers of pigs for slaughter, a decrease of half since 1995. The number of such pigs per herd averaged 377 in 2003, but nearly 60% belonged to herds of at least 750. Sweden is a sizable importer of pork.

Sweden also has substantial production of eggs and poultry, which is dominated by a few large enterprises. The production of mutton and lamb is comparatively small in Sweden and is characterized by great structural stability.

The Common Agricultural Policy (CAP)

When Sweden joined the European Union on January 1, 1995, it also became a full participant in the EU's Common Agricultural Policy (CAP).

Under the CAP, the EU has created a single market for agricultural products and foods, with free exchange of goods between member countries. Goods produced in the EU are protected by tariffs that make goods imported from elsewhere more expensive than those produced in the EU.

Goods exported to countries outside the EU can receive export subsidies, which in principle should be equivalent to the difference between the higher EU market price and the world market price.

Sweden's membership in the EU and the CAP created a new production andmarket situation for the country's food processing sector. Swedish farmers and food processors had previously sold their products mainly in the domestic market. They now gained access to the entire EU and world markets on the same conditions as their counterparts in other EU countries. Meanwhile competition in the domestic market from producers in other EU countries intensified.

This meant that Sweden became subject to various price and market controls inthe EU, but also gained access to various agricultural subsidies. Swedish agriculture received SEK 9 billion in direct subsidies in 2002, largely divided among the following forms of subsidies: area aid, livestock premiums, environmental support and regional support.

AREA AID AND LIVESTOCK PREMIUMS[406] One form of direct support is arable area payments to farmers cultivating specific crops such as cereals, oilseeds, protein crops (beans and peas) and linseed. Furthermore, compensation is granted for arable land that is with drawn from production, that is, left in fallow or used for the production of industrial or energy crops. In 2002, just over SEK 4.0 billion was paid to Swedish farmers in the form of area aid.

Another form of direct payment to compensate for reduced prices is livestock premiums. This support is granted formale animals (bulls and steers), suckling cows and ewes. In Sweden, it amounted to approximately SEK 1.5 billion in 2002.

ENVIRONMENT SUPPORT Over the past few decades the transition to increasingly intensive and technically efficient agricultural practices has had a negative impact on the environment.

The Swedish environmental program for agriculture consists of three parts:

- preservation of biological diversity and the cultural environment of arable land plus the preservation of open landscape in forested areas and northern Sweden,
- protection of environmentally sensitive areas,
- measures to stimulate ecologicalagricultural practices.

Great efforts have been made to reduce leaching of ammonia, phosphorous and nitrogen due to agricultural activities. During the past decade, the use of chemical pesticides has been cut by half.

Swedish farmers can apply for special environmental subsidies, which serve, in avariety of ways, to promote environmentally friendly practices. The EU agri-environment program provides 50% of the funding. Support is granted, for example, to preserve the biological diversity of grazing land and hayfields, valuable naturaland cultural environments, open arableland, wetlands and small waterways, ecological (organic) cultivation, multi-year green fodder farming and the raising of domesticated animal species threatened with extinction.

An expanded program covering both environmental and rural policy went into effect for the period 2000–2006, with the aim of promoting the ecologically, economically and socially sustainable development of agriculture, food production, forestry and rural areas. The program costs a total of SEK 21 billion, of which about 45% is co-financed by the EU via its budget. Environmental grants apply for a period of five years, and in 2002 a total of SEK 2.4 billion was paid to Swedish farmers.

After Sweden joined the EU, certified organic cultivation rose from 50,000 ton early 363,000 ha in 2003, or 14% of arable land. The target is 20% in 2005. The average organic farm is 46 ha, while an average conventional farm is 38 ha. Organic farming can no longer be considered small niche production for a few rich consumers of health foods, but has become part of mainstream agriculture and has entered a period of strong growth and development.

REGIONAL SUPPORT AND STRUCTURAL SUPPORT The general objective of Swedish regional policy is to provide people with employment opportunities, access to services and a sound environment regardless of their place of residence. The EU's structural and regional

[406] Source: Swedish Institute. www.si.se

policies have similar objectives. Northern Sweden – like the forested and non-arable areas of the central and southern Swedish mainland as well as parts of the Baltic islands of Öland and Gotland – qualifies for partially EU-financed compensation grants to less-favored areas.

Compensation can be granted for growing grain and potatoes as well as for raising cattle, ewes and goats if there is sufficient fodder acreage.

In northern Sweden, regional support is made available in the form of compensation grants and national subsidies. National subsidies are provided for milk production, slaughter pigs, eggs, piglets and goats as well as for potatoes, berries and vegetables.

Other structural funding to the agricultural sector that is partially financed by the EU includes start-up support for young farmers and investment support for the establishment of permanent facilities within the agricultural, horticultural and reindeer husbandry sectors. In 2002, a total of SEK 0.8 billion was paid to Swedish farmers in the form of regional support.

REFORM OF THE CAP In June 2003, the EU agriculture ministers reached agreement on a reform of the Common Agricultural Policy (CAP).

The reform embodies two important changes of principle in the CAP. One is to transform existing direct support to farmers into income support, making farmers independent of their type or scale of production. This support may be provided as a single farm payment based on earlier production and/or may be allocated as a regional payment based on acreage. The only requirement is that farmers fulfil certain requirements: they must keep farmland in good agricultural condition and comply with environmental, food safety and animal welfare legislation.

The other important change of principle is that member countries are being given greater influence on how agricultural policy is shaped within their own borders. This increase in their influence means that member countries may choose whether all payments should go to farmers regardless of production or whether a portion of payments should be conditional on maintenance of certain production. As a result, agricultural policy may vary to some extent from one country to another.

The political agreement will also mean cutbacks in direct farm payments (“modulation”) of 3% in 2005, 4% in 2006 and 5% in 2007. The funds thereby saved will be used for environmental and rural development efforts aimed at more effectively achieving sustainable agriculture.

SWEDEN’S VIEW OF THE REFORM According to the Government’s written communication 2003/04:137 to the Swedish Parliament, the reform is consistent with the view of the Parliament on the direction in which the CAP should be changed and should be regarded as a step forward. There form is a step toward limiting costly excess production. The decoupling of production payments will mean greater freedom for farmers to grow what consumers are demanding and will thus mean that their production will be more consumer-adapted and cause less trade disruption, thereby benefiting trade in foods. This is especially important to developing countries, which for many years have criticized EU agricultural policy because of its adverse impact on their food production and trade. Sweden will also continue to call for the EU to reduce and discontinue agricultural subsidies that disrupt trade.

The Government's communication adds that the decision implies the existence of a ceiling for CAP budgetary expenditures.

IMPLEMENTATION OF THE REFORM IN SWEDEN. The new agricultural policy will go into effect in 2005. The new decoupled single farm payments, totaling about SEK 6.6 billion, will be introduced in the form of a regionalized support model (mixed model). This model mainly implies a regionalization of existing direct support (area aid and livestock premiums), with all farm acreage in a region receiving the same basic support per hectare, but with a certain proportion of the payments – primarily in the animal sector – remaining farm-connected. As a transitional measure, a connection between male animal premiums and production will be retained because otherwise there is a great risk that slaughter animal production would be significantly reduced. One important point of departure for designing the mixed model has been to minimize the financial strains to agricultural enterprises by trying to avoid large undesired reallocations of CAP payments.

Existing environmental and rural development programs will be strengthened by appropriating additional funds in less favored areas, raising environmental compensation for grazing land and meadows and introducing environmental compensation for ley (grassland) cultivation. In addition, funds will be provided for investments in the animal welfare field and small-scale food production.

Policy proposal to improve territorial impact of CAP

In all three Nordic EU member states, major renumerations on the membership fees are paid within the Common Agricultural Policy (CAP). Denmark receives more than 200 € per capita annually from the Agricultural Fund, Finland 150 € and Sweden 90 €. Most of these resources are distributed to individual farmers without any geographical priorities – within the so called Pillar 1 schemes for market price support to crop and livestock products and for compensatory payments to farmers. In Denmark, Pillar 1 accounts for as much as 97 percent of CAP payments. In Sweden, Pillar 2, including various measures to support farmers to contribute to rural development, counts for 20 percent and in Finland to as much as 40 percent of total CAP payments.

The principal conclusion from the ESPON project "The Territorial Impact of CAP and Rural Development Policy" is that in aggregate the CAP works against the ESDP (European Spatial Development Perspective) objectives of balanced territorial development[407]. CAP does not support the objectives of economic and social cohesion. This is not surprising, since Pillar 1 has never been a cohesion measure. In terms of polycentricity at the EU level, Pillar 1 of the CAP appears to favour core areas more than it assists the periphery of Europe. At a local level CAP favours the more accessible areas. In recent years the CAP has undergone a series of reforms. Some of these have begun to ameliorate these conflicts of objectives. For example, direct income payments to farmers tend to be distributed in a manner more consistent with cohesion than market price support. Similarly, higher levels of Pillar 2 payments are associated with more peripheral regions of the EU than is the case with Pillar 1 support. The

[407] ESPON Project 2.1.3 "The Territorial Impact of CAP and Rural Development Policy" was coordinated by The Arkleton Institute for Rural Deveopment Research, University of Aberdeen, with Mark Shucksmith as Project Leader. Andrew Copus, currently at Nordregio was member of the research team in Aberdeen and Lars Olof Persson, Nordregio was Project Special Advisor. The Final report is available for downloading from www.espon.lu

rural development Pillar 2 may in come cases be more consistent with cohesion within countries, but runs counter to EU-wide cohesion in the way it is currently structured. The Second Pillar is still focused mainly on agricultural producers rather than on territorial rural development.

CAP is turning more to agri-environment measures. These are found to contribute to prudent management of and protection of nature and cultural heritage through encouraging a reduction in inputs of inorganic fertilisers, conservation of habitats, and preservation of the cultural landscape. The provision of support for organic production is given a high priority in several countries - among them Denmark - has the potential to contribute to balanced competitiveness through high quality food production targeted at niche markets. Agri-environment programmes can also make an important indirect contribution to economic and social cohesion through the provision of income support in marginal areas, thus contributing to the retention of rural population.

The ex-post evaluation of LEADER found the programme both efficient and effective. LEADER is a community Initative pursued in a limited number of rural areas – currently 12 in Sweden – stressing local cooperatioon and innovation. It proved to be adaptable to the different socioeconomic and governance contexts and applicable to the small scale, area based activities of rural areas. It could therefore also reach lagging regions and vulnerable rural territories. LEADER activities induced and conveyed responsibility to local partnerships, linking public and private institutions as weil as different interests of various local actors to a common strategy. It was found that change from a passive_to an active attitude could be achieved among many local_actors.

In Sweden LEADER has recently been critisized for not leading to new employment in rural areas. But for sure, LEADER is not an instrument to change local economic structures or revalorise the local economy in a direct way, but rather an instrument to stimulate processes in the local economy so leading to indirect but enduring benefits. Many core projects do preliminary work in activating rural actors, and this is then a stimulus to further economic activities. The potential of LEADER lies especially in the improvement of intangible factors, in raising awareness, in strengthening strategy and cooperation.

Policy Proposals

It is clear that a purely sectoral approach is less successful in enhancing and stabilizing the performance of a region, whether rural or urban. Despite this the notion that rural development goals widely overlap with agricultural policy is still characteristic of the CAP. An integrated, territorial approach, sensitive to the diversity of rural circumstances, rather than a sectoral approach, is needed to ensure regionally balanced development and territorial; cohesion.

While tangible factors such as natural and human resources, investment, infrastructure and economic structure have traditionally been seen as the main determinants of differential economic performance, more recent research has highlighted the important role of 'less tangible' or 'soft' factors, including various kinds of social, cultural, institutional,

environmental and local knowledge which constitute the basic capital for regional development[408].

In its policy proposals, the research team refers to the main conclusions of the Salzburg Conference organised by the European Commission in November 2003. There was consensus around three broad objectives:

1. a competitive farming sector;

2. managing the land for future generations; and

3. a living countryside.

It is noted that the first of these objectives is inherently nonspatial, except insofar as the agri-food sector can find and add value to local and regional farm output. It should not be expected that agriculture, even if diversified or innovated, can in future support previous levels of farm occupiers and incomes. In regions which "lag behind" despite best efforts, policy attention directed at territorial cohesion must shift even further towards alternative sources of economic activity and income. Objectives 2 and 3 above are more capable of direct territorial interpretation in policy terms, but only if careful account is taken of relative territorial capacities and resources.

The Salzburg conference also concluded that rural development policy should apply in all rural areas of the enlarged EU; and that rural development policy must serve the needs of broader society in rural areas and contribute to cohesion. In other words, rural development should be more than just a sectoral approach linked to agriculture. It clearly has an important territorial dimension.

The research team proposes, first of all, that the Pillar 2 budget should be increased progressively. This proposal follows directly from the conclusion that Pillar 2 offers the best potential for amending agricultural and rural development policy to support territorial cohesion and other ESDP objectives. The more quickly support is transferred from Pillar 1 to Pillar 2 the more consistent the CAP will become with cohesion objectives. Moreover, the expenditure of funds under the CAP will be more defensible if they are directed towards 'public goods' such as the cultural and natural heritage, environmental benefits and sustainable rural communities.

The team recommends that the new Rural Development Regulation 2007-2013 should contain a broader range of permitted measures, building on the lessons from LEADER and Objective 5b by including more measures which address sustainable rural development beyond the agriculture sector and which have a territorial dimension. Encouragement should be given to innovation. More measures should be open to non-farmers. It is very likely that this recommendation willl be on the agenda for discussion in the recently (2004) started public investigation of rural development in Sweden Directives are quite narrowly focused on on agricultural farms and farmers as the primary actors in rural deveopment.

Turning to Pillar 1, it is likely that there will be further revisions of the Market Price Support arrangements as a result of the currently ongoing WTO negotiations. The more that WTO negotiatians result in reductions in Pillar 1 Market Price Support, through reductions in border

[408] cf Bryden & Hart 2004

protection and a convergence of EU prices with world prices, the greater the resulting consistency of the CAP with cohesion objectives. As it is now the Market Price Support element dominates the CAP and benefits overwhelmingly the richer, core regions at the expense of the poorer, declining and more peripheral parts of the EU.

The food processing industry

The Swedish food processing industry is a mixture of small, locally and regionally active private companies, large private and farmer cooperative companies with a national emphasis and very large internationally active food processing groups. The industry mainly uses Swedish agricultural raw materials for its production, and some 70% of domestic agricultural products are used by the food processing industry in Sweden. Other agricultural products are used directly for human consumption, as animal fodder or for export.

The food processing industry is Sweden's fourth largest industrial sector, measured in production value, about SEK 136 billion in 2003. It is Sweden's fifth largest industry in terms of employees, with more than 60,000 in 2003. It accounts for about 10% of Swedish industrial production and 9% of industrial employment. The Swedish food processing industry turns out about 2.1% of the total food produced in the 15EU countries – about the same as Sweden's share of the overall population in these countries.

There are nearly 3,000 workplaces in the industry, located all over Sweden, but only about 360 have more than 20 employees. From a local employment standpoint, food processing is most important on the Baltic island of Gotland (50% of industrial jobs) and in Skåne (20%).

Despite increased competition in the domestic market due to EU accession in1995, the decline in food processing employment has been relatively limited. Many companies have been able to take advantage of improved market conditions and have increased their production and exports.

The food processing industry can be divided into about fifteen sub-sectors, each with its own special features and operating conditions. In size, the dominant subsectors are meatpacking and the dairy and bakery industries, which together provide jobs for more than 60% of food processing employees.

Swedish-owned companies account for nearly 65% of food processing production, and foreign-owned companies for the remaining 35%. Among Swedish-owned food processors, the farmer-owned cooperatives are dominant. They account for about 45% of total production and are especially prominent in meatpacking (Swedish Meats), the dairy industry (Arla Foods) and milling and bakeries (Cerealia). Some major family-owned businesses in food processing are Gunnar Dafgård (frozen and convenience meals), Spendrups (brewery), Löfbergs Lila (coffee), the Pågen Group (baked goods) and Berte Qvarn. The latter, a flour mill founded in 1569, is Sweden's oldest food processing company.

Foreign ownership in the food processing industry grew sharply during the1990s and today represents about the same percentage as in the Swedish manufacturing sector overall. This growth took place both through acquisitions of Swedish companies and because foreign-owned companies have concentrated their production and employment for the whole Nordic region in Sweden, the largest single Nordic market.

Future challenges

Swedish agriculture and food processing are internationally competitive, as the trend of exports shows. Another positive sign is that most transnational food processing companies have chosen Sweden as their base for production and sales in the Nordic and Baltic countries.

Competition will intensify, however, especially due to EU enlargement in 2004. Meanwhile the growth of the Swedish market is limited by weak growth in population and personal consumption. Growth has averaged 1–2% annually in recent years, and part of this has been captured by imported foods. If the food processing industry in Sweden is to grow, it must increasingly seek new markets abroad.

New consumption patterns due to changes in values related to the environment, ethics and health issues are meanwhile becoming ever more apparent among consumers. Most development work underway in the food processing industry also aims at better satisfying consumer wishes for new, attractive and safe food products. This places new demands on both raw materials and food products.

In this context, one source of strength for the food processing industry is that Swedish farmers have invested in environmentally sound, sustainable production systems that also take into account ethical aspects of cultivation and animal husbandry.

Another source of strength for the industry is the creative collaboration that is underway between nutritional and medical researchers and food processing enterprises, which has already resulted in a number of high-quality, health-oriented products.

A third source of strength is the traditional collaboration between the food processing industry and Swedish-based internationally active packaging and processing equipment companies. Swedish food processors have, in many cases, benefited from serving as a test market for new processes and packaging systems.

Some agricultural and food processing organizations

The Federation of Swedish Farmers (Lantbrukarnas Riksförbund, LRF) safeguards and promotes the professional interests of its members in farming, forestry and agricultural cooperatives. Its main activities lie in influencing opinion, monitoring economic policy and providing advice and services to members. Its members are farmers, agricultural cooperatives and other industry organizations. It is independent of party politics.

Other influential organizations in the agricultural and food industry include the Swedish Dairy Association (Svensk Mjölk), the Swedish Farmers' Supply & Crop Marketing Association (Svenska Lantmännen) and the Swedish Food Federation (Livsmedelsföretagen).

Among other agricultural organizations is the National Union of Horticultural Producers (Trädgårdsnäringens Riksförbund, TRF), an association of market gardeners, fruit growers and nurserymen.

The agricultural societies (hushållningssällskap) are among the oldest associations existing for the promotion of agriculture. Most of the 24 existing today were established in the early 19th century and are still going strong. Among their wideranging activities are agricultural, horticultural and economic consulting; providing information to farmers and consumers; and plant growing experiments.

6.2.2 Rural tourism in Sweden

The tourism industry in Sweden has a turnover of 167 billion SEK and accounts for 127 000 twelvemonth employments (helårsarbeten) according to Turistdelegationen in Sweden. The tourist sector ranges over a wide variety of activities and settings from urban-rural areas, annually events (music festivals) attracting an international audience to and local initiatives. Interesting in the rural setting there are initiatives with an origin in the natural resources and the rural environment (fishing, living on a farm concept, horse and riding farms). These initiatives to offer services (events, rental houses, overnight stays, concept travels) to visitors are carried out at a local-regional or national level by private and public networks and actors. The renewed interest of tourism as a sector also includes research and compilation of some statistics of the area. However the availability of key statistics is still under development. The statistics show that the Swedish people have different preferred destinations in summer and wintertime where the skiing resorts in northwest Sweden (such as Sälen and Idre in Dalarna) came at third place (after the city regions) in attracting visitors during the winter season (ETOUR 2003). Other measures are developed to get an understanding of the importance of the tourism sector as to the region as a whole (number of visitors/ number of inhabitants and year), see table below.

	Mora (Rural area)	*Stockholm (Urban area)*
Visitors / inhabitant & year	35	< 5
Position in attracting Swedish visitors	3rd most visited region (winter)	The most visited Swedish region (winter and summer)

This illustrates some of the challenges the tourism industry face from a regional innovation perspective with seasonal changes in number of visitors and employees, while the region heavily depend on this business sector.

6.2.3 Manufacturing in Sweden

Manufacturing industry in Sweden is of major importance, even if production was reduced considerably during the recession in early 1990s. Since 1993, however, the industry has increased by more than 50 percent and now represents 1/5 of GDP. Except the economic importance it is important for employment. Currently 19 percent of total employment in Sweden is in manufacturing, which makes it the second largest private sector.

6.2.4 Profile of the Dalarna region

The county of Dalarna incorporates the northwest region with a rich cultural heritage and skiing facilities while the south of Dalarna have a tradition in steel and metal industry and also make the core area in terms of education and service. The region has EU Objective 1 – in the northwestern sub region with low population density - and Objective 2 status – in the central and southern municipalities - and the structural funds together with the regional growth programme has generated a rich flora of projects and networks initiatives.



Dalarna has:

- the size equal to Belgium (about 28 000 km²)
- 15 municipalities
- 280 000 inhabitants (2003)
- 10 persons per km² (Swedish average 22 persons)
- EU Objective 1 and 2 status

Figure 2. Facts about Dalarna (source: Dalarna County 2002).

The Swedish regions are divided in six different 'regional-families' (regionfamiljer) a concept introduced by Nutek in 1998 to enable meaningful comparison between regions with similar character (rural characteristics, university region etc) and two different types of regions are found in Dalarna (ITPS-NUTEK 2002: 78-80).

The northwest part of Dalarna (around Mora) is characterized as a 'small region with public sector focus' while the central and south region (Falun/Borlänge) is a described as a 'regional centre'.

The occupation in the steel industry is mainly focused in the south part of Dalarna while the region as a whole (as other forest-regions in north of Sweden) have a high share of occupation in public service areas of education, nursing and geriatric care.

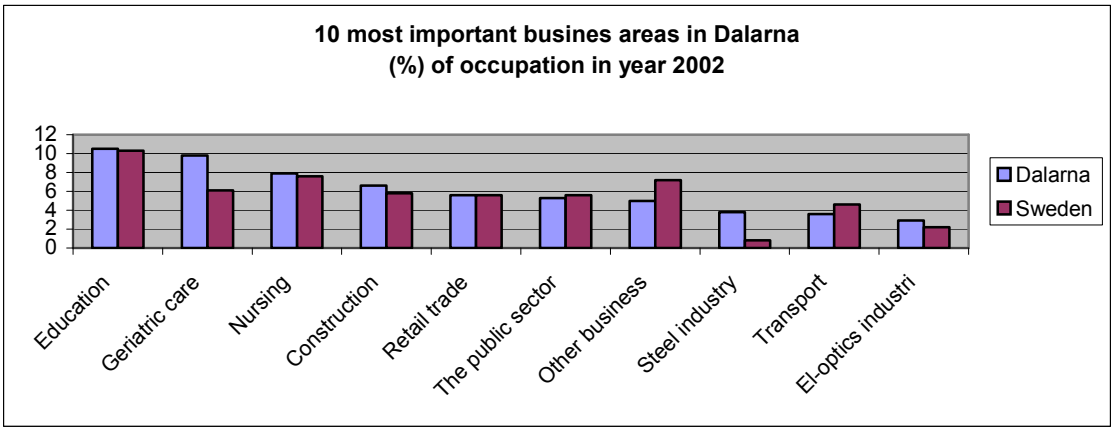


Figure 3. Business sectors in Dalarna (source: Region Dalarna 2002).

6.2.5 Agrifood industry in Dalarna

The workplaces in agriculture and forestry in Dalarna are small compared workplaces in other sectors in Dalarna. Half of the firms without employees (i.e. including one-person firms where the owner is the only employee) are found in the agriculture and forestry sector (Dalarna County 2002). The distribution of workplaces in sectors in Dalarna show that one third of the workplaces (also including the one-person firms) are found in the agriculture, forestry and fishing industry, compared to 18 % as a Swedish average. Looking at number of employees about 2,6% of population (about 3000 persons in year 2000) in Dalarna were employed in the agriculture sector (including forestry and fishing), compared to 1,9% as a Swedish average. In 1996 the share was 5,1% in Dalarna. The arable area in Dalarna is estimated to about 61 000 ha, of which the main share is used for used for pasture (about 30 000 ha), fodder grain (about 20 000 ha). The remaining share is fallow and field not in use, bread grain, potatoes, other crops (including garden plants), energy forest, oil plants and flax. The animal farming consists of horses, cattle (milk and meat), sheep and hens.

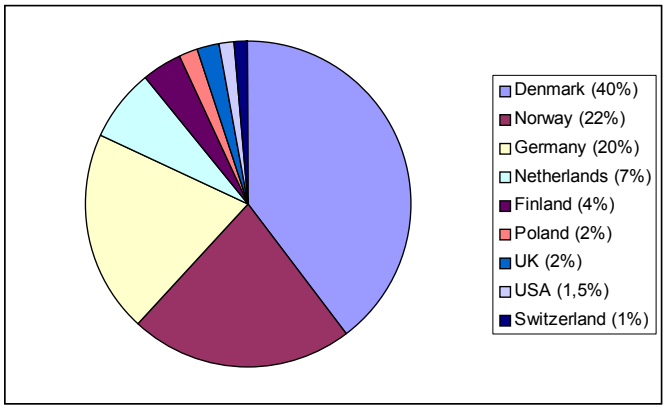
	Pigs	**Sheep**	**Horses**	**Cattle**	
				Milk cows	Cows for calf rearing
N.o. animals	**5 600**	12 500	8 500	11 000	4 000
% of nation	0,5 %	2,8 %	3,8 %	2,6%	2,3 %

6.2.6 Tourism in Dalarna

Dalarna is Sweden's 4th largest tourist area with more than 16 million overnight stays and the area around Siljan is the 4th biggest tourist destination (following the Swedish main urban regions: Stockholm, Göteborg, Malmö) with 2 million visitors and 4,9 million overnight stays. The skiing destinations Sälen and Idre in Dalarna are attracting many visitors in the

winter season. Other tourist activities are based on lakes and rivers (fishing, river rafting and canoeing) and culture (UNESCO world heritage, art, music and literature).

Most visitors are Swedish (84% of overnight stays were Swedish in 2001) and only a small share (1%) from outside Europe. Most international visitors come from: Denmark, Norway, Germany, Netherlands, Finland, Poland, Great Britain, USA and Switzerland.



International tourist nationalities visiting Dalarna (in 2001). Source: (Dalarna County 2002).

6.2.7 Manufacturing in Dalarna

”Dalarna´s business sector is founded on natural resources – forests, iron ore and water. Still this is an important basis which has been strengthened and broadened by technical knowledge and technical visions. Dalarna has a number of large export corporations with high tech production and international competitiveness. A very important part of the businesss sector are the small and medium sized companies and in some rural areas a longstanding tradition of self employment for as additional income.”

Still, manufacturing industry is important and according to labour market outlook 2004 it is considered as a ”key industry in Dalarna”. It employs 25 000 people.

In Dalarna, enterprises are relatively small in the northern and western parts of the county, while larger companies dominate in central and southern parts. In the north and west, there are many small forest based companies, furniture and wood processing as well as building industry. Metal firms are more frequent in Borlänge and Falun, in Ludvika and southern Dalarna. In these parts there is some food industry and machinery.

Currently, the SMEs in Dalarna have a very strong business cycle (2003). Labour shortage is the most important obstacle for growth in the SMEs. In spite of a general decrease in employment in the sector, there is a need for replacement of retiring labour. The mean age for industrial workers is second highest in Dalarna among all Swedish counties. Among enterprises with less than 1000 employers, the demand for labour is expected to grow.

In recent years, labour shortage has been obvious for welding operator, machinery mechanics, workshop mechanics, metal pressing, electricity and telecom technicians. As enterprises cannot recruit staff there is generally a drop in production. Manufacturing industry programmes in secondary schools have in recent years had less applicants and the program i threatened by close down. However, there are positive local efforts leading to more students. One example is wood education in Falun, which now is a part of the Hand Craft Programme called ”Wood and Design”.

The "Att.. project" is a resource platform which will inspire, coordinate, support and make efforts to in the short and long term makes manufacturing companies in Dalarna more attractive and ease their recruitment problems to ensure a long term growth. The vision is that Dalarna and its enterprises will be noticed nation-wide and internationally by their attractive working life and an attractive living environment. Some 15 persons cooperate in the project, representing The University College of Dalarna, Institute for Working Life, IUC (Industrial development centre Dalarna) etc and is financed by EU Objective 1 and 2, the County Board, Regional Employment Board, participating companies and organisations[409].

6.2.8 The official framework for business services and innovation facilitation

The following initiatives are presented: Future for Dalarna, Regional growth agreements 2000-2003, Regional growth programme 2004-2007, Objective 2 North Sweden, Objective 1 South, Innovative action in North Central Sweden, Interreg IIIA Inner Scandinavia, Rural developments programs.

Future for Dalarna – two scenarios

Source: Framtid för Dalarna – två scenarier. Eurofutures 2003

The report analyses the current situation and indicates five strategic conditions for Dalarna´s development:

- Dalarna´s competitiveness in terms of knowledge intensive industries
- Dalarna as a functional region
- Dalarna´s exchange with Metropolitan Stockholm region
- Dalarna´s attractiveness for young people
- Dalarna´s territorial cohesion

Two scenarios are presented until 2015. One of the labelled as "A slow farewell", illustrating the gloomy consequences of a lagging industrial structure, ageing population and poor competitiveness in relationship to the enlarged Europe.

The second scenario, on the other hand, outlines a new role for Dalarna. A strong tripartial relationship develops between the public, the private sector and academia. Digital meeting places and improved transport infrastructure to Metropolitan Stockholm makes the SME based industrial sector flourishing. The University College is transformed to a full University status.

[409] Source: att informera Nr 11 2003

Dalarna's Growth Programme

In Dalarna's Growth Agreement 2000-2003 six competence areas were prioritized and promoted:

LCD-technology

Intelligent Transport Systems (ITS)

Dalhalla (open air concert hall)

Compact wood "hardwood"

Material technology and advanced forming

Center for electric power and computer science in Ludvika

The title of the current RGP 2004-2007 (Regionalt tillväxtprogram för Dalarna 2004-2007) is "A viable programme for longstanding sustainable Growth in Dalarna". It stresses that:

The programme was developed in a process involving all relevant actors.

Flexible organization

Strategic cooperation and coordination of common resources

The over-arching goals and guiding stars for Dalarna's Programme are: openness, curiosity, creativity, learning and flexibility. The road to sustainable growth is deepened dialogue and cooperation between businesses, education/research and society as well as strong support by cooperating local and regional actors.

Three major themes have emerged from the process:

Creative Dalarna

Learning Dalarna

Attractive Dalarna

Creative Dalarna, which is of main interest in this project, points at the importance of entrepreneurship. In order to display the spirit and the "paradigm" which the Programme for Sustainable Growth in Dalarna is based upon, we quote from the Programme:

A good leadership driven from a long term knowledge- and development objective, coupled with creativity and innovative thinking in cooperation with national and international actors, is strategic for the development of the business sector and the objective sustainable growth.

Networking and network construction is necessary for SMEs to have a chance to be noticed in a larger context and to strengthen their competitiveness. By constructing strong and developed networks, a creative and growth friendly environment could be created.

The business sector has to be prepared for sharper international competition.

Design is until now a very much ignored resource. Design is function, form and accessibility. Altogether, design adds value to the market value of any product. High quality has the same function.

Innovative cooperating milieus are considered crucial for growth. Innovations are defined as ideas for new products and services, but also new ways of working. From these ideas often new ideas are born which can generate growth and employment for a long future. Co-operation – between firms, between firms and academia or between firms and public actors – where various competences, experiences and resources are combined can as such contribute both to innovations and new business ideas.

How then, can innovation and cooperation be promoted, it is asked in the Programme. The answer is also given: it is about how society and the education sector at best can cooperate with the business sector in a given field in order to promote growth. For making entire Dalarna benefit from this new way of organising work firstly the University's influence must cover the whole county, secondly the schools and continuing training in learning centres (called "*lärcentra*") must be involved. In summary the following objectives are set up for Creative Dalarna:

Strengthen the cooperation between actors

Strengthen and develop the innovation systems and clusters available today and support initiatives to create new clusters.

Integrate entrepreneurship across the whole education system from pre-school to post secondary level

Stimulate entrepreneurship within the public sector

Continuous education of teachers in entrepreneurship

Improve preconditions for qualified process leading during the programme period.

Objective 1 South

The aim of the European Structural Fund programme in Objective 1 is to promote the development and structural adaptability in areas that are lagging behind in development (NUTEK 2004a). 5 municipalities in north-western Dalarna are covered by the programme: Älvdalen, Orsa, Malung, Vansbro and part of Mora. The vision of the Objective 1 Södra Skogslänsregionen programme is the achievement of a growing business life and entrepreneurship, and the development of the region's already favourable living environment in order to attract new people. There is an awareness of the fact that the future of the region lies in the hands of its own inhabitants. According to the programming document, individuals, companies, organisations and authorities must join in the effort to realise this vision.

The priority areas below have been drawn up, each with a target vision.

1. Development of trade and industry – strengthened, diversified and innovative business life.

2. Life long learning and development of human resources in work life – strengthened skills in trade and industry, improved educational level in the region and increased integration and equality.

3. The development of agriculture and forestry, development of the rural areas and of the fisheries industry – strengthening the competitiveness of the countryside and sparsely populated areas and promoting a long term sustainable development.

4. Development of living environments and infrastructure – strengthened regional and local attraction power to attain improved accessibility.

The measures taken within these areas will, during the programme period, contribute to 8 000 new and maintained jobs, create 1 000 new enterprises and offer education to 20 000 persons in 2 000 companies.

Programme Half-Time Results

The mid-term evaluation reports that as regards the half-time objectives stated in the programme complement, Objective 1 Södra Skogslänsregionen has attained the set up goals for two core indicators, namely new enterprise and individuals in skills development activities. As regards the first priority area, Development of trade and industry, the evaluator claims that there is a *remarkable span of activities in the projects that are directed towards the companies*. The evaluatordraws attention to business life projects that collaborate with educational, cultural and housing efforts. In the areas that are considered especially promising when it comes to development – the innovation and diversification of trade and industry in the region – four out of five projects have come to treat the visiting industry, whereas the demand on other areas, such as the service industry, the refinement of high quality wood produce and environmental and energy development has not been as high. Around 40 research projects fall under the first priority area. Most of the projects could be characterised as applied research in the area of technology. Several projects are characterised by a cluster philosophy and connect with the business life of the region. A few dozen projects in the category of learning centres or study centres are also part of the priority area. The opinion is that these projects may have a potential for long term structural change.

As regards the Environmental and Rural Development Plan within Objective 1 Södra Skogslänsregionen, i.e. within Priority Area 3, evaluators have mainly stated opinions on the advantages and disadvantages of the system where the agricultural support is integrated in Objective 1.

There is a wide variation in the projects within the joint priority area for an attractive living environment and infrastructure. Project funds go to rural development programmes run by the municipality, to local service solutions, to regional cultural programmes as well as to the protection of natural and cultural environments. IT infrastructure is mostly a matter of broad band development, whereas transportation infrastructure is a matter of making investments in a small number of airports.

Objective 2 North Sweden

Objective 2 Norra include 31 municipalities in the counties of Dalarna, Västmanland and Gävleborg (NUTEK 2004b). 10 municipalities in central and southern Dalarna are covered by

the programme: Avesta, Falun, Borlänge, Hedemora, Leksand, Ludvika, Rättvik, Smedjebacken, Säter and part of Mora. The budget of Objective 2 Norra comprise close to SEK 1.6 billion in EU funds. The overall aim of Objective 2 Norra is for the programme to create potential for the development of trade and industry, as well as competitiveness by way of increasing the knowledge provision of the area. An additional aim is to increase the number of gainfully employed persons and the number of people employed in the service sector and to increase the share of people with post secondary school education. With this in mind, two priority areas have been drawn up:

• *Development of trade and industry.* Company development and the creation of potentials for a prospering business climate are emphasised. Big companies in traditional lines of business provide a basis. Small and middle sized companies are necessary to increase the employment rate and for business renewal. Out

of the funding for the development of industry and trade, one fourth will be used to support new enterprises.

• *Knowledge-driven development.* The three university colleges in the region are important assets to this priority area. The objective is to increase the share of post secondary school education among both men and women.

During the programme period, these efforts will – according to the operational goals set up in the launching of the Programme contribute with 8 000 openings, 2 000 maintained jobs, 2 000 new enterprises, in addition to the 2 000 individuals in 500 companies who participate in skills development projects.

Programme Half-Time Results

According to the mid-term evaluation, the programme displays a clear profile based on infrastructural efforts, educational efforts and university college and business collaboration. The funds earmarked for broad band development are comparatively large. Educational projects, such as study and learning centres have been successful. The collaboration between university college and business areas is developing by means of several high-tech projects, where education and research are combined around various business clusters.

The efforts made to create study and learning centres promote social groups that normally do not have access to large resources, i.e. women, immigrants and youths. The evaluator stresses that it is important to identify projects with good staying power, meaning that they are able to live on using their own resources while they also have an innovative effect. Evalators note that the meaning of renewal can be to direct oneself towards the traditional trade and industry with the distinctive features of the region and renew it by using new technology, finding ne w markets or new concepts of how the individual character of the region can constitute a development factor. In this context, the collaboration between university college and business life forms part of the innovation.

The evaluators note, however, that the horizontal aims – environment, equality and integration – are poorly integrated in the programme. The reasons being that the horizontal aims are brought up too late in the handling of the project applications.

Innovative Action in North Central Sweden

Innovative Action in North Central Sweden is a programme financed by the EU's Regional Fund and the counties that form part of the North Central Sweden region; Dalarna, Gävleborg and Värmland (EC 2004)**.** Innovative Action first and foremost targets small and medium-sized businesses working together, universities, university colleges and other competence centres. Innovative Action is also aimed at associations and co-operatives, as well as public authorities. The Programme fosters unconventional and cross-border undertakings as well as promotes creativity and innovative solutions.

The European Commission has approved Euro 3 million for a regional programme of innovative actions in North Central Sweden (Norra Mellansverige) including Dalarna. During the period 2003-2004, the European funding will attract Euro 2.09 million in further investment from the public sector and Euro 0.91 million from the private sector creating total resources of Euro 6 million. The aim of the programme is to accelerate the process of conversion from a traditional economy to a "new economy". The programme is directed primarily towards helping small and medium-sized businesses to develop innovative systems and practices. The programme is to be viewed as a strategic tool to cope better with changes and to encourage risk-taking which are both necessary in order to achieve increased growth. Multi-party co-operation, clusters and innovation systems plus sustainable development are three central components, which are to permeate all activities in the programme.

Three main lines of actions are planned: knowledge and technical know-how, innovation capacity, and exchange of experience and network building in Europe. The exchange of experience and network building with a view to identifying, disseminating, developing and implementing innovative methods and also for Preparations and planning further work connected to Interreg, for example Interreg IIIC.

Examples of projects in the Innovative Action:

"Wood industry and the University College" Project manager: IUC Dalarna AB

Dalarna has a long tradition of forestry and forest-based industry. The region is relatively less deveoped in wood mechanic and wood processing industry. These industries are too small to perform their own R&D. Hence, the region must improve its ability consume research results. The projet aims at initiating a "Knowledge Network Wood" (Kunskapsnätverk-Trä) to becom a central actor between the uiversity colleges and the wood processing firms in the region, and to create synergies between the partners. The purpose is to

Investigate the needs for cooperation between these actors

Investigate how the competences in the universities could be utilized in an efficient way

Prepare a work plan indicating forms for cooperation between the public and the private sector

Prepare wood firms to take advantage of student who have taken the course in "Design and wood technology" given at the regional university

Wood Fiber Composite ”Träfiberkomposit”. Project manager: IUC Dalarna AB

Mixing wood and modern environmental friendly thermo plastics is a fairly new technilogy. Products based on this technology is increasingly substituting several other plastic products. There is an increasing market for windows and doors in Europé. The only wood fiber factory in Sweden is located in Orsa, Dalarna,

The purpose of the project is to deveop the unique competence in the region and to strengthen thge comparative advantage relatively to other countries. The aim is a cluster based on cooperation between the businesses, R&D-centres and the university. The target group consists of plastic industry, wood, automobile, furniture and food industry.R&D-centres and the university

Interreg IIIA Inner Scandinavia

The programme is to initiate, develop and strengthen the Swedish-Norwegian contacts (Source: Mid-term evaluation of the Interreg IIIA Sweden-Norway programme). An overarching idea is that there is something to gain through increased co-operation across the Sweden-Norway frontier. The vision is to develop an attractive border region aimed at attracting residents, visitors and business and industry. The Inner Scandinavia programme covers Värmland County and parts of Dalarna County in Sweden (municpalities Malung and Älvdalen) and Hedmarks fylke and parts of Östfold and Akerhus fylken in Norway.

Business and industry and skill development are aimed at raising skill levels in the border region's numerous small and local labour market regions and making them strong and competitive by increasing the degree of co-operation between business and industry and the various training bodies in the border region.

Living environment and social development are to make use of the border region's distinctive features thereby - by focusing on the population's well being - creating a sound and attractive region to live in, work in and visit.

Initially the evaluators underline the fact that there is a big demand for what the programme has to offer, a fact that brings about good conditions for an increasing number of projects as well as a critic mass of result at the final phase of the program. On the other hand, bottlenecks can be noticed considering the inflow of projects resulting from specific program requirements. The programme assessment of the projects focuses especially on the capacity of finding and establishing co-laboration between Swedish and Norwegian organizations as well as to the indicators describing the cross border elements in the projects. Many potential projects fail in the initial stage as a result of the complication of establishing a functioning co-laboration across the border. This implies that the threshold of submitting a formal application is higher in the Interreg program compared to many other programs. Many good project ideas will, consequently, never reach the formal application and selection process. It is worth to point out that, accordingly, it seems to be a kind of intrinsic self selection beyond the control of the more formal programme selection process.

The evaluators can settle that a number of results and experiences have been generated at a project level and the message is that the projects are carried through in line with the aim of

the program. The outcome shows that the cross border cooperation and the border related problems are important momentums in the operations of the programme. Tangible results related to frontier obstacles, collaboration relations across the border and good experiences have been collected in a relevant portfolio of projects, which gives the programme a unique position in the elaboration of regional strategies.

Teknikdalen Borlänge (Technology Valley)

Technology Valley – Dalarna´s Technology Park (www.teknikdalen.se) was initiated in 1988 and is managed by a foundation with the corporations STORA Enso and SSAB, the National Board for Road Administration, a bank and the Municipality of Borlänge as founders.

Dalarna University College and the National Board for Rail Administration are also represented in the board. During the 1990s, a large number of IT firms have moved to Teknikdalen. Today, the site also includes Transportcentrum (Transport centre), parts of the University College and research institutes as VTI (Road Research Institute).

Teknikdalen Foundation leads and participates in several project, some of them described here:

Design in Dalarna

The vision is to increase the design content in the production of goods and services in Dalarna in order to improve profitability in firms, create new businesses and focus on Dalarnas ambitions and competences in the field of design. Three fields are approached, namely basic services, competence and business development. The ultimate aim is that the project should become a self-financed agency for spreading of design across Dalarna.

Info City

A framework project aiming at facilitating local communities' transformation from manufacturing industry to information- and knowledge-based industries.

Transport and Communication Cluster

Dalarna has specific assets for an emerging cluster in this field, based on the two national Boards for infrsatructuer which headquarters are located in the very center of the region. The head quarters were relocated from the Stockholm region as a regional policy measure in the 1970s.

Cluster Event Industry

Event industry has a long tradition in Dalarna. The region is the third largest tourist destination in Sweden, based on both summer and winter attractions. Teknikdalen describes itself as the "network architect" for developing new forms of events in Dalarna.

Recruitment pilot

The project functions as a facilitator for businesses and organizations in Dalarna to recruit key competence by finding suitable jobs for accompanying spouses and providing attractive housing alternatives for migrants to Dalarna.

IUC (Industriellt Utvecklingscentrum)

The major shareholders in the private limited company IUC Dalarna are local and regional companies. Through their services IUC help companies to initiate and develop their businesses by working jointly with other companies and interested parties. IUC Dalarna specialise and have expertise in the wood and heavy industry sectors. The focus is on industrial and regional growth through strategic development of: in house expertise, markets, products, processes and technology. IUC can offer key skills in the following:

- Product development
- Financial solutions
- Company growth
- Staff and management development
- Resource management
- Enhancing business competence
- Liason between key stakeholders
- Sales and Marketing

IUC Dalarna offers a meeting point for regional and industrial development where entrepreneurs, business sponsors, researchers as well as experienced public and private sector managers are able to meet and work together. In doing they have a real opportunity to become a viable business in the region.

IUC has – among other things – the comission from the state to stimulate industrial development and growth. The main target group is SMEs in manufacturing. The idea is also that IUC should function as a link between large corporate firms and the small ones. By developing the network between the university and other competence centres IUC strives to be able to offer the single firm qualified suport.

IUC is present in 20 places across Sweden and every Center cooperates in a national network. Each IUC has its own niche, which means that various competences are supplied. The services offered to firms are support to product innovations, business management and competence development. IUC Dalarna has two business divisions. One of them is targeting wood processing firms, the other targets firms in other technical industrial sectors. Most IUC consultants – seven of them - are located in central Dalarna, but also one in each of two rural locations (Mora and Garpenberg). IUC is owned by two of Dalarna's large steel corporations, by some municipalities, labour unions and several SMEs in the region.

Högskolan i Dalarna (University college Dalarna)

Dalarna University College has – as other universities in Sweden - three major tasks, namely to provide courses and study programmes, to pursue research in several disciplines and multidisciplinary fields, and finally the "third" task given by the state, namely to co-operate with the surrounding society in education and research. Some project examples are:

Development pilots

The University College of Dalarna claims that 75 percent of all innovations are made in the interface between firms and other organizations, e g universities. This project links Dalarna University and its resources with SMEs across Dalarna with the help of local links, called development pilots.

These originate from learning centres and local business agencies in municipalities. The pilots are selected and trained to have very good knowledge of both the local business sector and of the resources in various fields at the regional university. Within the university development engineers are trained to develop efficient methods for co-operation with the firms. This project aims at stimulating small firms' "everyday inovations", both process and product innovatoions. The motto reads "*From a regional development perspective and an innovation perspective, it is at least as interesting if 100 SMEs take one step forward each, as it is that one large company takes 100 steps forward*". The project starts as a test at a small scale and is implemented in the Siljan region. The project is synchronized and linked to neighbouring activities such as "Innovation Dalarna", "Environmental driven product development" and in contacts with Dalarna County, Region Dalarna, Teknikdalen, Företagarna and ALMI (Source Utvecklingslots broschyr.pdf)

Innovation Dalarna

Innovation Dalarna is a regional innovation centre associated with the national initiative Innovation Sweden. The services provided are counselling, networking and limited seed financing to innovators across the county. Some dissemination work is pursued, e g lectures, seminars and fair visits. The activities are done in co-operation with Innovationscentrum Foundation and ALMI. Funding is provided by the County Board and EU structural funds.

The business idea is expressed in the following terms. In order to get products on the market there is a demand for knowledge, networks, venture capital and business-mind. In the early stage a good idea needs both counselling and capital in order to develop and generate growth, at the same time as risks at this stage are too large to attract private financial capital.

In co-operation with national, regional and local actors and (public) financial agents, the regional innovation centres evaluate new product ideas. The trade mark for these centers is a common logotype and similar name. This trade mark authorizes the activities and certifies the innovation counselling and the right to approve grants from the funds of Innovationscentrum Foundation which are directed to each county.

The criteria for achieving grants from Innovation Dalarna is that the idea should contain something innovative, either goods or services. The agency's special competence is to evaluate, help and support new ideas in the early stage.The focus on the product's commercial viability. The services provided by Innovation Dalarna are free of charge.

Networks and action groups – light scale manufacturing

Source: www.dalarna.se

CaLignum is a registered trademark for products made by comprimated wood. It is mainly used for floors, stairs, and other applications where high durability is demanded.

Orsa Träutveckling (OTAB) was initiaated as a link beteen firms in the business of comprimated wood. The task set up was to develop R&D projects in co-operation with various wood processing industries in Sweden and abroad. By developing co-operation with OTAB wood firms in Dalarna access a knowledge base and other support for further expansion.

OTAB – now included in Inland Wood - is owned by an association with the University College and a number of wood firms in the region. The municipalities of Orsa, Mora, Älvdalen and Falun and Rättvik are supporters to the association. .

Inland strives to become the most efficient channel to the market for wood industry in the interior of Sweden, It has the ambition to develop into a trade and knowledge firm for wood processing firms the area. It targets the SME's R&D and marketing divsions in order to promote further processing of raw material. It aims at developing products together with suppliers and customers in co-operation with arcitects, designers and constructors. The products promoted should be characterized by good form and function and be environmental friendly.

Source: http://www.inland.nu/

Design

SommarDesignKontoret is an initiative by SVID, Stiftelsen Svensk Industridesign (Foundation for Swedish Design) where 92 students from university colleges and universities are placed at 16 different design offices in Sweden. Every design office have employed between 4-7 students that are now working in idea-oriented assignments in smaller companies. The main aim is to enable university students to the labour market and at the same time as local companies have a chance to find out the competence of the students. The companies get a better understanding of the relevance of design and many of the companies also get new perspectives on their work when the young designers deal with practical aspects in their company. The students also benefits from getting work life experience.

(Source: http://www.orsa.se/naringsliv/sommardesign/hemsida/index.html

Swedish Log Home Association

The Swedish Log Home Association is a strategic network for manufacturers of log homes in Sweden. The members consist of a number of cooperating groups and individual log home manufacturers. The purpose of the association is to:

- Bring together manufacturers in an organization for the purpose of competing on the larger market, especially abroad,

- Establish common quality assurance norms, CE-registered products and a common assortment keeping the individual variations,

- Create resources to technically develop the branch,

- Work for competence development within the companies,

- Help the individual companies with negotiations and business deals,

- Have a common market organization, especially for the export markets.

6.3 Findings from the study of the agrifood industry

6.3.1 Background information

Three of the interviewed firms are small with less than 10 employees and two companies have between 60-80 employees. The turnover of the companies is between 3 millions to 125 million SEK. The supporting organisations interviewed were active at local, regional and national level.

Interviewed firms	**Supporting organisations**
Pyramidbröd	Länsstyrelsen i Dalarna (regional council)
Leksandsbröd	Företagarna i Dalarna (regional organisation)
Orsa Kvarn	Hushållningssällskapet (local organisation)
Siljans Chark	LRF - The Federation of Swedish Farmers
Veg-e-Way	Wäxthuset – LRF regional division in Dalarna
	Falun municipality div. of industry and trade

The food industry studied in Dalarna has a strong regional identity and market its products by the regional brand. Even though the agriculture sector is often considered a traditional industry, efficiency demands have generated innovation in products and production processes. Diversification is also taking place in terms of niche-strategies where the firm (here a farm) is faced with fundamental questions of sources of information in choosing a renewal-path, may it be renewal by ostriches farming or energy forest, based on consumer preferences and energy-policy agendas. EU-structural funds and common agricultural policy naturally have a significant impact on choices made. In the food-processing industry, renewal can be related to market segments (younger people and single households) but also the use of products (crisp bread used as serials) to give some examples.

6.3.2 Knowledge and competence base

Difficulties in finding certain competences (kvarnmästare and charkmästare) but good supply from cities like Leksand and the universities in the region. Employees involved in production do generally not have university education, while management staff (of the two larger companies) preferably have university background or 10-20 years experience from other companies in the food industry. Some contacts with universities have resulted in new employees. The firms are also involved in labour market programs fighting long terms unemployment. Other contacts with universities and support organisations are made to renew competences necessary for firm renewal and innovation (business and marketing education, legislative aspects of small-scale food production). Advantages in systems thinking and environmental awareness in agriculture are also considered to be important to cope with change and the need to diversify and take up activities such as energy forest etc.

6.3.3 Innovation activity

Two of the successful firms in the region (Orsa Kvarn and Siljans Chark) were started by joint efforts of farmers in the region. Investments made to improve efficiency in production

(machines for larger volumes, increased speed in packaging products) represent process innovations. Some concrete examples of product innovations are focusing on new flavours of bread, pork-free sausages to meet the demand also from ethnic groups, and use of historical crops (Dinkel, Spalt) in response to health trends (Glychemical index etc). Diversification of farm activity is a driver for service innovations. This is taking place in terms of niche-strategies where the firm (here a farm) is faced with fundamental questions of sources of information in choosing a renewal-path, may it be renewal by ostriches farming or energy forest, based on consumer preferences and energy-policy agendas. EU-structural funds and common agricultural policy naturally have a significant impact on choices made. In the food-processing industry, renewal can also be related to market segments (younger people and single households) but also the use of products (crisp bread used as serials) to give some examples.

6.3.4 Cooperation and networks

Interviewees in Dalarna stress the importance of networks (distribution and branding networks). The cooperation that exists between university and research institutions is mainly taking place between the two larger companies interviewed with between 60-80 employees. The type of cooperation taking place in those companies are in terms of students writing masters thesis on company issues such as packaging design. Problems identified by firms in terms of cooperation with universities in projects are related to high overhead costs at university. Other aspects of the collaboration could facilitate the interaction is that students and universities should be more specific in what they want to address in their research. Activities initiated at university (such as courses in entrepreneurship and business relations with China) and by firms in collaboration with supporting organisations (such as company visits and forums for university-industry interaction) could facilitate contacts. This could also be a measure to support the small firms in finding the right person for the job in their business. Many small firms have raised concerns on problems of protective labour legislation preventing them from growing. This is important from a growth policy perspective since firms in Dalarna are quite reluctant to expand their business.

International	IKEA, Customers in Russia, Denmark, Danish university (business management), Swiss key competence education
National	SIK (R&D institute for food industry), Swedish association of farmers (LRF)
Regional	Distribution & branding networks (Hushållningssällskapet), regional LRF, County board, entrepreneurship courses
Local	Local craftsmen (machine development), Siljan Food, municipality

Food industry: Resources and nodes for innovation approached by local firms

6.3.5 Innovation conditions

Several interviewees mention Objective 2 area as an advantage. Other general trends such as health (producing quality products), lifestyle (fast food, event-industry) are seen as opportunities for the firms. Other perceived opportunities are triggering measures in firms to target specific groups (vegetarians, ethnic groups, single households, younger people, health concerned groups). Some of the interviewees (as well as supporting organisations) mention the development of markets for organic food as an area with potential, but also points out obstacles (higher consumer prices) to be addressed.

The link between high environmental performance and quality of products are stressed (traceability of meat, healthy and high quality primary production) and that these aspects can be a competitive advantage for local business in Dalarna. One problem by the small size of production (and small scale processing at the farm) is the efficiency of the distribution network, how they can reach a critical size to be able to compete with other (established brands) in the supermarkets. To address that there are local initiatives (Hushållningssällskapet) aiming also at providing knowledge about necessary administrative procedures that the individual farmer need to fulfil to develop new farm based products.

6.4 Findings from the study of the tourism industry

6.4.1 Background information tourism

The interviewed actors in the tourism industry include both individual firms, supporting organisations and networks.

Interviewed firms	**Supporting organisations**
Orsa Grönklitt AB	Turistdelegationen
Säfsen Resort AB	Dalarnas Turistråd
Multicat System	Siljan Turism AB
Dalhalla	ETOUR
Art of nature	Fulufjällsringen
Living on a farm	

Firms and supporting organisations and networks interviewed in Dalarna

The municipalities around Siljan have marketed the local region successfully. Many interviewees emphasize the closeness to the market as a big advantage. Several facilities were in the beginning publicly owned, but are now private. The development of networks and organisations that promote the tourist events and activities in the region around lake Siljan in Dalarna is rather active. The activities are often linked to traditional food and farm concepts.

Examples food sector: ‘Mat runt Siljan’ event and Hushållningsällskapet (distribution networks) Examples tourism: Siljan Turism, Dalarnas Turistråd, Fulufjällsringen

6.4.2 Knowledge and competence base

Several interviewees mention the importance of monitoring of development in the surrounding world. The competence demands seem to be focusing on entrepreneurship rather than academic knowledge. However some key competences are found also in the regional perspective by the establishment of education programs in the region with focus on tourist sector. Some of the attractions (bear park, open air theatre) build on specialised scientific or engineering knowledge (zoology, wind proof construction for outdoor music events) in order to provide well-informed services to the visitors while. The technical skills and know-how in combination with efficient marketing channels and skills are also important for the events industry. Ecology and preservation of natural and cultural heritage is considered as important in the tourism sector as a whole.

6.4.3 Innovation activity

For example, a goal for innovation in the tourism sector is to expand the tourist season, for example with special activities organised outside the winter skiing season (conference trips, special sports and activity camps) or by artificial snow. There is much focus on concept-travels. One goal is to develop more concept travels where you do not only sell a fishing-permit to the lake when the tourists arrive but provide a tailor-made concept-travel that attracts visitors. Some initiatives are made in marketing and organizing joint events between the tourist attractions in order to encourage visitors to choose Dalarna based on a variety of activities for both children and adults including arranging bus trips between the attractions.

6.4.4 Cooperation and networks

Many interviewees tell about intense cooperation with suppliers and retailers. It is important to be connected and associated with certain trademarks and brands, such as Vasalopppet, IKEA and WWF PAN Parks. Some actors have cooperation with university colleges and other institutes that carry out research about the natural resources in the area or other topics (zoology or design in construction for open air music events) closely linked to the needs of the firms.

International	Visitors (Denmark, Holland, Germany, Norway, the UK, new EU countries), IKEA, European zoo-park association, WWF Panparks
National	Turist delegationen, Stockholm univ. Nutek, Vinnova, Swedish visitors, Tourist Institute (Göteborg)
Regional	Networks of regional actors (Dalarnas turistråd, Etour) also involving local farmers (living on a farm concept), Rättvik University college, Swedish college of travel and tourism (Orsa)
Local	Siljan turism, Fulufjällsringen, municipality

Tourism: Resources and nodes for innovation approached by local firms

The target groups of visitors are families and middle aged couples with car. The Swedish tourists come from Mälardalen region, and international visitors from among other countries, the Netherlands, Denmark, Germany, Norway and the UK. The lifestyle tourism and nature experiences are central concepts for 'private visitors'. In the category 'business visitors' there is a focus on active conferences, sport camps etc.

6.4.5 Innovation conditions

Sweden is expensive for foreign tourists due to taxes and there is competition with destinations abroad. Hence, quality must compensate for the relatively higher prices. Some interviewees mean that the tourism industry in Dalarna should be seen as a core industry since it is attracting visitors that will benefit other sectors (handcraft, service industry etc) but also everyday consumption. The tourism (or events) industry is abstract in its nature and it is difficult to measure the effects of marketing comparing to traditional industry with increased or decreased sales of products. Almost all interviewees mention these factors as a disadvantage in terms of access to investment capital. Other obstacles are related to infrastructure, rules in accounting and unhealthy competition. However the spirit of entrepreneurship seems to be good and is compared to other regions in Sweden (such as Gnosjö) well known for flourishing entrepreneurial activities.

6.5 Findings from the study on light-scale manufacturing industry

6.5.1 Background information light scale manufacturing industry

The case study of light scale manufacturing in Dalarna comprises firms related to wood and metal industry, which traditionally are two of the basic industries in the county of Dalarna.

Interviewed firms	**Supporting organizations**
Log Max AB (forest machinery)	Inland
Tractive AB (machinery for cutting reinforced concrete)	Teknikdalen
Ortic AB (machinery based on new rollforming technology)	Innovation Dalarna
Släpliftprodukter i Ludvika AB (ski pist equipment)	Länsstyrelsen Dalarna
JA Industri och hantverk AB	Stegvis AB
ME Plåt (thin metal)	Högskolan Dalarna
	IUC Dalarna

6.5.2 Knowledge and competence base

The owner and manager of the small enterprises in this sector in Dalarna are typically "self-made" men with a long personal experience from the industry but with little formal training. The single key role of the entrepreneur/manager of the small firm in aquiring new knowledge

and innovating products and processes is evident in all cases. Typically, also the current work force has low formal education but often a long career as skilled workers. The commitment of the companies' employees is mentioned as a key factor for competitiveness by most interviewees.

Administrative staff has typically post-secondary education from the regional University College or other Universities in Sweden. A larger company, such as Log Max, employs 20 persons with post-secondary education and 30 with vocational training at secondary level. More or less all firms report difficulties to recruit reliable staff with the relevant qualifications and experiences. The shortage of this type of labour is reported to increase over time. Interviewees claim that problems are accentuated both by the current school system and by the motivation for choosing industrial jobs among the younger generation. "*There are no incentives for youngsters to go to manufacturing today*", In some niche-branches, it is obviously not possible to supply relevant vocational training courses at secondary level. Some firms regularly employ trainees from the industrial and technical programmes at secondary schools. Internal education is limited and mostly restricted to training in utilizing new technology.

The own machinery equipment, and the skill to operate and adjust it, constitutes an important competence base for many of these firms. Not seldom the equipment is unique for the particular firm at least in the region and hence a competitive advantage.

6.5.3 Innovation activity

More or less all firms declare firm renewal - introduction of new activities and new products – is a constantly ongoing process driven by the firm manager in direct contact with customers and suppliers. Major incremental renewal happens typically at some 5-7 years intervals and takes place as new instruments and machinery is invested. The key facilitators in this incremental renewal are often the market agents for machinery equipment, and the banks.

In one case, the manager has developed the firm from an own innovation (computer system in metal industry) derived from own research. In this case the innovation is new for the world market. Some firms are innovative in terms of design and finish of the products, often deveoped in close contact with demanding customers

One firm manager and owner emigrated to Dalarna from Austria. His business idea stems from his patent for ski pist machinery.

One example of innovative products in light scale manufacturing in Dalarna is based on WOODFIBER COMPOUNDS. The product is wood fibre reinforced compounds for injection moulding and profile extrusion. The innvation means "improved process times, decorative apperance, reduced material costs, improved mechanical properties, less shrinkage, thick walled products, wooden feeling, waste free production, less weight, less abrasive, environmental prestanda and renewable raw materials."

6.5.4 Cooperation and network

Informal and person-to-person networks are by far the most important for innovative activity for the small firms in this sector. These networks link the manager with individuals: colleagues, suppliers, customers and sometimes experts at large companies with R&D

capacity in relevant fields. Membership in branch organisations often leads to a general awareness of common challenges for the branch as such.

Few entrepreneurs with more traditional products and production mention networks and participation in projects launched by semi public agents as important for generation of new products or processes at the firm level. There are several networks connected to the wood industry which have been initiated spontaneously or with the support of national or EU programmes.

The firm, which has developed from an innovative computer system, has several sorts of networks, both in the region, elsewhere in Sweden and in Germany. One important network in this industry is "Nätverk Tunnplåt" is a local network among metal manufacturing firms in Dalarna, closely related to the SSAB plant in Borlänge.

Several firm mangers say that the contact expertise whenever there is a need for a good advise. Contacts with Företagarna are common in some firms.

Most firms have contacts and mainly positive experiences with the local municipality – both local politicians and business promotion agency.

International	Suppliers in Germany and France Customers in China
National	Suppliers and Customers
Regional	County board, SSAB steelworks, Teknikdalen, Dalarna university college, Innovation Dalarna,, Inland wood network, Nätverk Tunnplåt, Customers in Dalarna, IUC, Suppliers and Customers in the region, Företagarna
Local	Municipal business promotion agency, Local politicians, Local business park

Light manufacturing: Resources and nodes for innovation approached by local firms

6.5.5 Innovation conditions

There is no general or common perception of the conditions for innovations in these industries, in Sweden or in the region. However most interviewees complain that the general conditions for business is relatively good in the region of Dalarna, but poor in Sweden as a whole. "*It is not funny to be an entrepreneur in Sweden. Taxation system is good, but it is terrible with sickness leave and rehabilitation requirements."*, to quote one interviewee.

Only few firms visited are depending on support by regional programmes and risk financing. Some declare that requirements for accessing public support are too complex and inflexible.

One manager developing advanced technology claims that the existing public programmes do not fit into his activities. "*VINNOVA (State board for innovation systems) only sponsors 'ballrooms and orchestras' and feeds the public sector only*", claims this manager.

The local university is not very present in most of the interviewed firm managers' minds. Some say that there is a myth claiming that universities can create new products.

More than one interviewee is seriously considering relocating to any new EU member state, because of poor business climate in Sweden. One of them says: "*The Government thinks that businessmen are gangsters – they punish us with all sorts of taxes and fees."*

6.6 Conclusions

Policy framework for innovation

The Swedish study has found a *gap between the official system and the perceptions and needs in firms*. Small and medium sized firms in peripheral regions in Sweden are the main targets for several regional development policy programmes, both EU and national/regional. The explicit objective for these programmes is renewal and growth of the industrial structure. The key word is knowledge driven growth. There are several measures implemented from investment support in the national regional industrial policy and support to environmentally friendly agricultural farm practices in the Common Agricultural Policy to network building between the public and private sector in the EU Structural Fund policy and to innovative actions, which is an EU initiative.

When small and medium sized firm managers and owners are interviewed, they reveal limited confidence – or even awareness - in this whole battery of public measures addressing their supposed needs. Managers and owners of SME in peripheral regions are highly depending on personal skills and professional networks as the main competitive strength. The incentives to growth are often limited. Eventual innovations in terms of processes and products are of more or less daily concern in firms in all sectors, whether it is in primary agriculture, food processing, tourism or small scale manufacturing.

The needs expressed from the interviewees are more often basic than sophisticated services from the public system: they demand skilled and motivated labour force, professional business services and a more general business friendly climate at the national scale. *National conditions for making business (tax and labour regulations) are most often mentioned as the major barriers to growth and renewal to SMEs in Dalarna.*

Entrepreneurs in SMEs in Dalarna meet a *virtual jungle of supporting agents at regional, national and EU level*. The innovation supporting policy framework in peripheral regions in Sweden has namely developed into a rich flora of projects, each of them generally lasting for 2-3 years – often prolonged under a different name - and managed by various actors and facilitators. Most projects originate from a more or less focused programme – EU, national or regional. Programmes are sometimes overlapping and coordination between projects as well as between programmes seem to be loose. There are numerous facilitators and stakeholders in this project economy: ALMI, Företagarna, Hushållningssällskapet, Region Dalarna, County Administration, the muncipalities, Teknikdalen, the University College, private consultants etc.

It is difficult – or impossible – for the SME entrepreneur to get an overview of which facilities and services are supplied for his/her needs.

Innovation activity

The *managers' and the entrepreneurs' own experiences driving force, contacts and networks are most important*, both in the business start-up, in daily or incremental innovations and in recruiting key personnel. Formal education of both employers and employees in most SMEs in Dalarna plays a limited – or no – role in facilitating innovations. "Innovating by doing" seems to be a relevant paraphrase for this strategy.

There is no doubt a *wide variety of product – goods and services - and process innovations* are pursued in the firms interviewed. In most cases, the *role of customers and suppliers inside as well as outside the region are crucial for the innovation activity*. Adjustment to customers' changing and more qualified is a must for sustained growth and viable SMEs in all sectors. Suppliers are in particular offering new material and new technology. In Dalarna, Sweden, *financial capital for investments in general available and supported by semi public agencies.* However firms in the tourist sector stress the lack of investment capital for their line of business.

Networks and competence base

Managers and entrepreneurs in SME claim that university *contacts are of minor importance* to most firms. However, particularly some larger firms interact with the university on specific competence areas. We have found such cases in design, zoology, tourism, education, and business management.

The *poor labour supply in parts of Dalarna regards both key competence and production staff*. There is a widespread lack of confidence among many SME entrepreneurs in the entire school system. It is considered poorly adapted to the needs of the small business sector in food industry, tourism and small-scale manufacturing. In addition – or as a consequence – it is difficult to attract young labour with relevant education to this sector. In response to this there are new courses initiated in the region in topics of entrepreneurship as well as targeting tourism sector. The low attractiveness for immigrants to smaller places in Dalarna is also mentioned as an obstacle to renewal of the labour force.

There is no doubt several *advantages for innovation in Dalarna being a part of the Swedish periphery. Regional p*olicy is boosted by EU-funds and projects. The regional Dala-identity – and even local identity in many municipalities - supports trustful social networks. Dalarna is a core region for traditional Swedish culture which attracts both old and new tourism. The regional university college is devoted to the triple helix role assigned by the government and makes it an increasingly strong core knowledge and service centre.

The problems of peripherality are well-known: Poor communication infrastructure to the periphery of Dalarna and in some part of the county the small and "insular" labour markets limit efficient firm networks and knowledge exchange. The policy challenge ahead is to take onboard the experiences from innovating firms about future need for new core competences and function of networks in order to establish informed policy making on modes and nodes of innovation and cope with changing conditions for innovation, diversification and capturing synergies (nationally and internationally) between and within sectors.

6.7 Summary

There are numerous supporting programmes for renewal and innovations of the industrial structure in Dalarna, Sweden: The Rural Development Policy (RDP) is part of the Common Agricultural Policy RDP aims at supporting sustainable - ecologic, economic and social - development in rural areas. Objective 1 and 2 Regional Development Programmes in some parts of the country, such as the case of Dalarna, provide support for projects aiming at increased the attractiveness for staying in and immigration to rural areas, e.g. local service plans, social economy including cooperatives, networks, information and place marketing. Leader + is EU's programme for rural development aiming at from local conditions and initiatives support new and innovative methods for renewal of rural areas. The EU Innovative Action first and foremost targets small and medium-sized businesses working together, universities, university colleges and other competence centres. The Swedish government introduced a new element of industrial policy in a bill on regional policy in 1998. Swedish regions were invited to design and negotiate regional growth programmes. General Regional Development Programmes are designed and implemented by means of Regional partnerships in each county also stressing the importance of business renewal and creating conditions for firms to innovate. The firms that are introducing novel products and new ways of production apply the concept of innovation within their firm and in interaction with other actors. In addition to this, the policymakers are also discussing development of policy programs in the terms of innovation in the policymaking process. Hence, the innovation can be applied to the *firm level innovations* (novel products and production processes), *inter-organizational* innovations (new ways of interacting) and *policy level innovations* (aiming at introducing novelty at the new ways of policy-learning by transfer and adaptation of policy from one policy area to another).

The three sectors studied in Sweden reveal that there is a great diversity in innovation activities in the region – ranging from patents to incremental product and process innovations. Workplaces in *agriculture and forestry* in Dalarna are small and one challenge in development of new products in small scale farm processing is the need for flexible solutions on distribution and also meeting the (administrative) requirements for legislation on traceability. However there are also examples where early strategies in developing routines for traceability of meat proved to be a competitive advantage for the firm. Investments made to improve efficiency in production (machines for larger volumes, increased speed in packaging products) represent incremental process innovations and the Swedish study identified several examples of product innovations and the drivers. Some examples are: new flavours of bread, pork-free sausages to meet the demand from ethnic groups, and use of historical crops in response to health trends. The results of the study also reveal interaction within and between the sectors of food industry and tourism. There are several initiatives and networks that promote the tourist events and activities in the region around lake Siljan in Dalarna. The activities are often linked to traditional food and farm concepts attracting visitors to both to the natural and cultural heritage. Dalarna is one of Sweden's most visited *tourist* area following the Swedish main urban regions: Stockholm, Göteborg, Malmö. Three major skiing destinations in Dalarna attract most visitors. Other tourist activities are based on lakes, rivers and culture. Driving forces behind innovation activities of firms in the tourism are found in expanding the tourist season by development of new concept travels, but also in the entrepreneurial development of machine equipment linked to skiing tourism facilities.

Dalarna has a number of large export corporations with high tech production and international competitiveness. A very important part of the business sector are, however, SMEs and in some rural areas a longstanding tradition of self-employment for as additional income. The manager of the small enterprises in the *light-scale manufacturing* sector in Dalarna is typically "self-made" people with a long personal experience from the industry but with little formal training. The key role of the entrepreneur/manager of the small firm in acquiring new knowledge and in innovating products and processes is evident in all cases. The own machinery equipment, and the skill to operate and adjust it, constitutes an important competence base. Not seldom the equipment is unique for the particular firm at least in the region and hence a competitive advantage. More or less all firms declare firm renewal - introduction of new activities and new products – is a constantly ongoing process driven by the firm manager in direct contact with customers and suppliers. Major incremental renewal happens and takes place as new instruments and machinery is invested. The key facilitators in are often the market agents for machinery equipment, and banks. Informal and person-to-person networks are by far the most important for innovative activity for the small firms in this sector. Only few entrepreneurs with more traditional products and production mention networks and participation in projects launched by semi public agents as important for generation of new products or processes at the firm level. There are several networks connected to the wood industry, which have been initiated spontaneously or with the support of national or EU programmes. Several firm managers say that the contact expertises whenever there is a need for a good advise. Most firms have contacts and mainly positive experiences with the local municipality, local politicians and business promotion agency.

Our first conclusion is that there is a *gap between the official system and the perceptions and needs in firms*. Small and medium sized firms in peripheral regions in Sweden are the main targets for several regional development policy programmes, both EU and national/regional. Hence, *national conditions for making business (tax and labour regulations) are most often mentioned as the major barriers to growth and renewal to SMEs in Dalarna.* Several firms, particularly in the food and tourism sector, have been or are taking part in and benefit from the policy framework for innovations. Entrepreneurs in SMEs in Dalarna meet a *virtual jungle of supporting agents at regional, national and EU level*. The innovation supporting policy framework in peripheral regions in Sweden has developed into a rich flora of projects, facilitators and stakeholders in this project economy. It considered to be is difficult – or impossible – for the SME entrepreneur to get an overview of which services and facilitators (ALMI, Företagarna, Hushållningssällskapet, Region Dalarna, County Administration, the municipalities, Teknikdalen, the University College, private consultants etc.) that are supplied for his/her needs. The *managers' own experiences driving force, contacts and networks are most important*, both in the business start-up, in daily or incremental innovations and in recruiting key personnel. Formal education of both employers and employees in most SMEs in Dalarna plays a limited role in facilitating innovations.

There is a *wide variety of product – goods and services - and process innovations* are pursued in the firms interviewed. In most cases, the *role of customers and suppliers inside as well as outside the region are crucial for the innovation activity*. Adjustment to customers' changing and more qualified demand is a must for renewal and growth of SMEs in all sectors. Managers and entrepreneurs in SME claim that university *contacts are of minor importance* to most firms. However, particularly some larger firms interact with the university on specific

competence areas. The *poor labour supply in parts of Dalarna regards both key competence and production staff*. There is a limited confidence among many SME entrepreneurs in the entire school system. It is considered poorly adapted to the needs of the small business sector in food industry, tourism and small-scale manufacturing.

There is no doubt several *advantages for innovation in Dalarna being a part of the Swedish periphery. Regional p*olicy is boosted by EU-funds and projects. The regional Dala-identity – and even local identity in several municipalities - supports trustful social networks. Dalarna is a core region for traditional Swedish culture, which attracts both old and new tourism. The regional university college is devoted to the triple helix role assigned by the government and makes it an increasingly strong core knowledge and service centre.

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Appendix A: Overview of nodes of innovation for the three sectors

International	IKEA, Customers in Russia, Denmark, Danish university (business management), Swiss key competence education
National	SIK (R&D institute for food industry), Swedish association of farmers (LRF)
Regional	Distribution & branding networks (Hushållningssällskapet), regional LRF, County board, entrepreneurship courses
Local	Local craftsmen (machine development), Siljan Food, municipality

Food industry

International	Visitors (Denmark, Holland, Germany, Norway, the UK, new EU countries), IKEA, European zoo-park association, WWF Panparks
National	Turist delegationen, Stockholm univ. Nutek, Vinnova, Swedish visitors, Tourist Institute (Göteborg)
Regional	Networks of regional actors (Dalarnas turistråd, Etour) also involving local farmers (living on a farm concept), Rättvik University college, Swedish college of travel and tourism (Orsa)
Local	Siljan turism, Fulufjällsringen, municipality

Tourism industry

International	Suppliers in Germany and France Customers in China
National	Suppliers and Customers
Regional	County board, SSAB steelworks, Teknikdalen, Dalarna university college, Innovation Dalarna,, Inland wood network, Nätverk Tunnplåt, Customers in Dalarna, IUC, Suppliers and Customers in the region, Företagarna
Local	Municipal business promotion agency, Local politicians, Local business park

Light scale manufacturing

CHAPTER 7: Conclusions

In this concluding chapter of the ISP project report, the research context of the project will be reaffirmed and the findings of the fourteen cases will be summarized with an emphasis on highlighting the similarities that were found between the different cases. Some conclusions on innovation systems will also be presented and policy recommendations put forward.

7.1 Reaffirming the research context

As in most other trans-Nordic projects, the research context of the different study areas varies considerably. Although the peripheral areas of the Nordic countries have a lot in common there are also considerable differences between the countries (see a summary of key characteristics of the different research contexts in appendix A). Some of these differences are associated with different scales in regard to geography, population numbers, scope of industry sectors, size of firms etc. Also there are some differences in the relative importance of different industry sectors, partly caused by the basic variation in geography and availability of natural resources. Finally, the fact that some of the Nordic countries are members of the European Union, while others are not, influences the composition of official policy and business development structures, as well as the general market environment of different industry sectors. As presented in the introduction chapter of this report, the research team has attempted to increase the level of comparability of the project's cases by using standard methods for narrowing down the research focus and to coordinate the research process. Nevertheless, when interpreting and applying the project's conclusions, the different research contexts, which the conclusions are drawn from, should be kept in mind.

The case study approach was chosen as a research strategy for the ISP project. The project included fourteen cases. Each of these cases explored the contemporary phenomenon of innovation within a single industry sector in a single Nordic area. The research approach, therefore, focused on understanding the dynamics present within a number of defined settings. It should be reaffirmed that a case study is not a survey, where reliability relies on the characteristics of the data collection tools, the sampling techniques and the sample size. It should also be emphasized that when choosing the types of research tools for the project and when designing the actual tools and procedures, the intention was not to collect data for statistical inference. **The case study approach, however, allows for systemic analysis of each case and the identification of common themes, patterns and trends among the cases. The approach can, therefore, be used for producing analytical conclusions and interpretations.**

7.2 Sector-based summary of case study findings

Below is a sector-based summary that highlights the similarities between the country-specific ISP findings. As could be expected the case studies from the different countries also revealed some findings and conclusions that were unique for each case or country. A closer look at those is provided by each of the country reports. These reports should give the trans-Nordic audience some valuable indications on what can be learned from the findings from each of the countries, and how those lessons can contribute to further integration of the Nordic innovation system (see section 2.6 for Denmark, section 3.6 for Finland, section 4.5 for Iceland, section 5.6 for Norway, and section 6.6 for Sweden).

7.2.1 Agrifood production (primary production/farming)

When summarizing the ISP project's findings for all sectors, the findings for the primary production part of the agrifood sector (farming) are probably the aspect of the project where the greatest similarities were found among the different cases. Although the basic characteristics of the farming enterprises, which were studied, were quite varied, not to speak of the market environment they operate in, the basic findings on the project's key themes were quite similar.

Innovation activity

Innovation activities, found at the farms studied, can most commonly be categorized as process innovation, e.g. installations of various new technological equipment, and procedures. "On farm sales" and Internet sales are also a new trend (seen in a number of cases). Innovations are mostly incremental and encompass implementation of novelties that commonly can be considered new to the farm ("in-house" level) rather than new on the regional and/or national level, although examples of such were found as well. Basic expansion, resulting in more efficient operations, is the most common goal of innovation activities, although improvements of working conditions or labour reduction is also an important element. This is in line with the general trend towards fewer and larger farms, which is taking place in all of the Nordic countries. Innovation activity appears to be directly linked to the age of the farmer (the younger being more active).

Knowledge and competence base

With only few exceptions, innovation activities at the farms studied, seem to be based on specific practical knowledge generated primarily by experience rather than within the formal education system. Personal competences, such as entrepreneurial spirit, also seem to be a key component of the knowledge and competence base, which innovations develop from. Although some of the farmers interviewed are quite active in seeking new knowledge. This is most often not directly linked to innovation projects, but rather to the every day activities on the farm (e.g. accounting or computer courses, etc.). This is not surprising, given the incremental nature of most of the innovation projects, which the study found on the farms visited. In most cases there is sufficient supply of various educational programs for farmers. The challenge seems to be to coordinate the different programs and to attract farmers to participate (see for example the findings from the Danish case). In some instances educational offerings and the farmers' participation seem to be locked within sectoral systems, which

might limited the farmers' utilization of programs of value for alternative farm activities or for broadening the basic knowledge base (see for example the results from the Icelandic case).

Cooperation and networks

Overall, the farmers interviewed seem to utilize a fairly broad range of networks and contacts. The types of interactions are quite varied (e.g. informal with colleagues and personal contacts, but formal with financial institutes). The key contact persons of farmers in relation to innovation processes (found in all cases) are other farmers (colleagues) and other personal networks, suppliers (e.g. of new equipment), and regional farming advisors. Industry associations and financial institutes are also commonly mentioned as important players in innovation processes on farms. Research institutes and universities/colleges have a insignificant role in innovation activities on farms. However, there are considerable indirect linkages through intermediary regional farming consultants in place. Cooperation and networking primarily takes place at the local and regional level and networks seem to be primarily sector oriented.

Innovation conditions

Despite the dissimilarities between the business environments of farms, in different Nordic countries, it can be argued that farming in all of the countries exists in a fairly rigid environment. The business environment is characterized by extensive policies and regulations, official production systems (at least for some branches of farming), traditional market structures and long-standing social networks. This basic nature of the industry greatly affects innovation opportunities and innovation processes within the industry. Innovation outlook for the farming sector can be described from a twofold perspective. Firstly, there are indications towards a continuing trend of larger and more efficient farm operations, including additional equipment and process renewals. Secondly, the outlook includes a trend towards the development of alternative farm products and farm procedures. Examples of this are organic production (e.g. becoming an important aspect of Danish farm production) and other types of niche production and marketing. Also activities that have to do with "on farm processing" have received increased attention (e.g. evident in the Norwegian and the Swedish cases). This encompasses some opportunities for production of various delicatessen and increased linkages with "farm visits" and other tourism activities.

EU Common Agricultural Policy (CAP) contributes to innovations in particular within Pillar 2, i.e. the Rural Development Policy, stimulating innovations particularly in environmental practices at the farm level. However, the market support scheme, Pillar 1, counteracts innovations in the agricultural sector and is much larger in terms of funding. For a discussion on this and the policy implications, we refer to "The Territorial Impact of CAP and Rural Development Policy", ESPON Project 2.1.3 Final Report (www.espon.lu).

7.2.2 Agrifood production (processing)

Innovation activity

Many types of innovation activities/projects were found among the processing firms included in the ISP study. Product innovations are the most evident, although various forms of process innovations as well as marketing innovation were also found. Some of the innovations were small, incremental, "in-house" innovations, but innovations that encompassed something new

to regional or national markets were also found. Innovation, seen from a broad perspective, seems commonly to be looked upon as a survival strategy. The purpose of innovation activities is, therefore, commonly to increase (or simply sustain) revenues by, for example, broadening product ranges, directing the production towards more "value-added" products, or by increasing efficiency through process and/or technology advancements.

Knowledge and competence base

Although the knowledge and competence base of the processing firms visited, varied quite a bit between firms and cases, overall we can say that various forms of practical knowledge, trade- and craftsmanship, certain types of technical know-how, and gained experience are the most evident building blocks for innovation in the food processing industry. University education (at the management level) is also important part of the knowledge base of the larger firms, especially in the Danish and Swedish cases, but not as evident with the smaller firms. The firms generally have limited contact or cooperation with research and educational institutes, and firm representatives generally did not express evident needs in that direction. This applies especially to the Norwegian, Finnish and Icelandic cases and to some extent to the Danish case, where new knowledge is often accessed and developed either through initiatives organized by industry groups and/or associations or developed internally, for example through apprenticeship contracts, recruitments, or by "learning by doing". The primary common needs (identified across all cases) for development of the knowledge and competence base, were needs for more extensive knowledge on markets, marketing and sales (trend-spotting, niche development, pricing, etc.). In some instances there is also a need for increased knowledge on product development, general management, and in the field of quality management.

Cooperation and networking

The intensity of cooperation and networking, as well as the types of interactions of the firms with other agents in their environment, varied considerably among the firms included in the study (also within each case). The findings from all cases show that firms cooperate on various geographical levels; some only at the local/regional level, but others possess a mixture of networking relationships on the local, regional, national or even international levels. Ideas for innovation activities, most commonly originate (found in all cases) from within the firms themselves ("in-house"), from suppliers (sellers of equipment, packaging, etc.), or from market agents (other firms/competitors, customers, etc.). When looking at common findings among all cases, these are also the agents that the firms most commonly partner or cooperate with in relation to innovation projects. Personal contacts of various sorts (friends, neighbours, school mates, etc.) are also important players in the innovation processes of the firms studied. In addition, industry associations have an important role in the Danish and Icelandic cases, and regulatory authorities have an important role in the Danish and Swedish cases. Cooperation with research and development agencies generally seemed to be fairly uncommon (except for in the Danish case).

Innovation conditions

The overall external conditions of the firms visited in the different study areas, varies noticeably. Apart from geographical differences, considerable dissimilarities are caused by the different status of the Nordic countries in the European context; Denmark, Sweden, and

Finland being EU member states, while Iceland and Norway are not. This influences both market related trends, as well as the structure of development and support programs. Many of the findings, especially from Denmark and Sweden, have to do with recent trends on the European market. An increased threat, posed by foreign food corporations buying out successful family firms, is one example of such findings from the Swedish case. The relocation of large food processing companies, away from Danish rural areas, is another such example in the Danish context. Another finding from the Swedish case reveals that the increasingly fierce competition on the European market has forced innovation in product development and marketing within the Swedish agrifood industry. Opportunities for market innovations have presented themselves for example in the form of introduction of traditional Swedish products to foreign markets (i.e. knäckebröd). In fact the Swedish agrifood industry has experienced considerable increase of revenues from agrifood exports in recent years. At the same time the main barrier for further development and innovations found in the Icelandic case is the smallness of the domestic market and the inability of the Icelandic agrifood industry to compete on foreign markets, given the current position in market alliances. In this context, we should stress that the ISP project does not build on sufficient data to make any supporting or rejecting arguments on the extensive dilemma on inclusion or non- inclusion of Iceland and/or Norway in the European Union. However, based on the ISP findings, it seems clear that the firm representatives from Sweden, Denmark and Finland, which were included in the study, expressed a somewhat more positive outlook towards the future innovation potentials of the agrifood industry, than their counterparts in Iceland and Norway.

7.2.3 Tourism

Innovation activity

Abundant examples of innovations were found in the five cases on the tourism sector. Most of the innovation projects encompass novelties on the regional or national level, although small incremental “in-house” innovations were also found. The nature of the innovations was quite wide-ranging; having to do with the initiations of new products and processes, as well as implementations of new marketing strategies that often targeted new groups of customers. The study focused especially on firms, which at least partly focus on recreational services. Examples of innovative projects, found in the cases, include extensive product developments (e.g. focusing on wilderness experiences and action-based activities such as winter sports, sailing, river rafting, horse-back riding, etc.), and renewals of strategies/processes (e.g. focusing on destination development or Internet marketing). Although varying from firm to firm, the primary goal of innovation activities is expansion (increased revenues). Many of the tourism operations in the study areas are quite small and are struggling to become large enough to be considered profitable. Since the great differences in the number of tourist visits, between the low- and high season, is a great challenge in most of the study regions, the innovation projects also commonly aim at extending the tourism season.

Knowledge and competence base

Multitalented entrepreneurs that possess various forms of practical knowledge and competences generally operate the tourism firms, which were studied. The individuals who run and work in the smaller firms generally do not possess extensive formal education at the university level, but commonly appear as energetic individuals with varied occupational

experiences. The larger, and often more mature firms, more commonly possess professional knowledge and competences e.g. concerning hospitality services, language skill, relevant certifications (e.g. official guide certification), etc. Overall, degrees or diplomas in tourism and/or management studies seem to be quite rare. An important finding, across all five cases, is the importance of knowledge of the local environment (including social, economic, cultural, and natural aspects). In all cases the tourism concept within the study regions is partly built on utilization of such existing knowledge. This is especially evident in the Norwegian case study. The firm representatives did not generally express great needs for improving the firm's knowledge and competence base. Also those few needs expressed were quite varied. The support agents, however, did generally not have any difficulties in identifying various needs in this regard, but these were also quite different among the cases. However, the need for increased marketing- and sales know-how is probably the most commonly mentioned need by both firm representatives and supporting agents, across cases. Generally, access to new knowledge is perceived to be at least moderately good by the representatives of the tourism industry, who contributed to the project. However, some of the cases (e.g. the Danish one) found examples of perceived barriers when it comes to access to specialized new knowledge and competences, which usually are only accessible in major, urban centers. In this regard it is the physical distance that can cause a problem, since especially the smaller firms have difficulties finding the time and resources for traveling.

Cooperation and networks

The innovation processes, found among the tourism firms visited, varied considerably, concerning the key contributors and the networking activities associated with the processes. When looking for common similarities among cases we can say that among the smaller and younger firms, the regional level seems to be the most common source of partners and contacts, while the larger and more mature firms as well as those that have been referred to as the "frontrunners" (or innovation champions) prefer to look abroad for ideas and contacts (see e.g. the findings from the Danish and Icelandic case). Personal contacts of various sorts (e.g. friends, family, colleagues, etc.) generally seem to be among the most common contacts, which firms interact with in relation to innovation processes. The level of interaction between the firms and suppliers and customers (including travel agencies), in relation to innovation projects, is also at least moderately high in all cases. The third communality among all cases is a relatively low interaction level between the firms and research and development agencies. The level of interaction between the firms and other firms (competitors) varies somewhat, although the findings of the Danish, the Swedish, the Norwegian cases, and to some extent the Finnish case, reveal quite extensive interactions in this regard. The Danish, Swedish and Norwegian firms, which contributed to the project, furthermore, generally indicate a high level of interaction with interest groups of various sorts. Industry associations also seem to have a role in the firms' innovation activities. In all cases firms were found that had considerable interactions with an industry association, although the Norwegian case revealed somewhat stronger relationships in this regard than the other cases.

Innovation conditions

As seen by the paragraph above, the overall intensity of cooperation and networking of the tourism firms studied, as well as the types of interactions associated with it, varied considerably. It seems reasonable to argue that the appearance of cooperation and networking,

as revealed by the five cases, has a lot to do with the overall development stage of the tourism as an industry sector in the study areas in question. Tourism, as an organized industry, seems to be a firmly established part of the "economic landscape" especially in the Norwegian case, but also in the Swedish and the Danish cases. This is quite apparent in regard to official policy development, the supply of support services and development grants, and the tradition for active industry associations. Meanwhile the Finnish study shows that tourism has not yet gained ground as a structured industry sector in the region studied. Also the findings of the Icelandic case indicate that even though tourism has greatly developed in the last two decades the industry structure and coherence could still do with some improvement. It seems evident that the development stage of the industry sector as a whole must affect innovation in the study regions. The Norwegian case, for instance, appears to be an excellent example of successful development of a formal and coherent industry structure, including a historical record of cooperation and networking, especially on the policy level, but also on the firm level, and a structure for multifaceted development efforts. This has resulted in a coordinated destination development with an input from a broad range of stakeholders. It seems reasonable to argue that this situation has and will be of benefit to innovation in the sector in the region.

In spite of the positive picture presented in the Norwegian case the visibility of the policy structure and various support programs, to the firms included in the Norwegian study, could do with some improvement. In fact this seem to be a common trend throughout all cases, i.e. official policies and support services do not have a strong presence among the firm representatives interviewed, in some instances limiting the application and effectiveness of the overall development systems. In some cases there also seem to be lack of certain support measures (e.g. development grants in the Icelandic case). In fact, with the exception of the Swedish and Finish case, all cases found some examples of frustration towards the lack of development funding and/or the high cost of finance. Although, the findings of the Swedish case are quite positive in this regard, there are, however, also some challenges apparent for the Swedish situation. Although there seems to be a great availability of various support programs and services on the regional, national, and supranational level, the transparency of the service system seems to be quite poor. In fact the support system has been referred to as "a virtual jungle of supporting agents at regional, national and EU level". The findings of the Swedish case indicate that firms can have a hard time finding their way within this jungle.

7.2.4 Manufacturing

As is quite evident form the different ISP country reports, the research context of the four manufacturing cases varied greatly. We have, therefore, chosen to present the key conclusions of each of the manufacturing cases separately below.

The case on the furniture industry in the Salling Area of Denmark

The sector in general is very international and thus facing increased competition from furniture producers abroad, especially in Eastern Europe, it has relative low research and innovation rates and has few new products ready for marketing, it makes limited use of the competences of the workforce and has a relative weak formal level of education of employees and management. The industry in general in Denmark lacks resources for innovation, especially funds and competences in design and marketing etc. The firms in the Salling

furniture cluster seem, nevertheless, to be very active with innovation strategies of incremental product development and design, together with cost-reductions and outsourcing. The challenges of the sector are met by support to education and competence-building in design and innovation. The companies are highly dependent on market information and express a need for knowledge and competence-building in this area. The companies also express a need for public support for the funding of research and development activities (tax reduction for expenditures). The companies are located in the Danish periphery because of historical reasons and are international in outlook and markets. In the periphery today, they take advantage of traditions as well as a well-motivated and stable workforce. They have unique skills and competences with regard to process technology and management, but problems attracting higher-educated employees because of tradition and cultural distance to these types of competences as well as geographical distance to design schools, universities, etc.

The case on the production of electronics and wireless technology in Oulu South (Northern Ostrobothnia) of Finland

The selected manufacturing branch was the electronics industry, which has been expanding in the study region since the mid 1990s. The electronics industry relates to the ICT-cluster, but it represents, in some respects, the manufacturing in the Finnish rural areas. In Finland, the big industrial enterprises are dominating the industry and a large amount of SMEs belong to their subcontractors. Vertical integration and the problems of dependency and vulnerability are also typical in many rural areas of mechanical wood and engineering workshops. The mechanical wood industry firms are building the networks through leading firms systems resembling the electronics in Oulu South. However, they can be isolated or located in a rural agglomeration, like in Oulu South.

The studied firms operated mostly in the value chain of wireless technology: contract producers, subcontractors, and component producers. In production firms the degrees of staff varied; vocational degree being the most general. In planning firms the staffs were mostly engineers or technicians. The staffs' technological skills and knowledge of production methods was a basis for innovation. Learning through work was important, especially through client's projects and orders. In addition, projects initiated by local developers were crucial. The firms needed more knowledge and skills on marketing as well as on specific technology.

Organizational and process innovations were most common innovations among the firms. The main contributors for the innovation were clients (other firms in network) and Centria, the R&D unit of the regional polycentric. The background of the innovations was often in the outsourcing process or in the needs of clients. The cost reductions forced the firms to innovate. Human and financial resources as well as the "demands of the time economy" were mentioned as major bottlenecks in innovation processes. The firms pointed to the positive attitude of municipalities and other local actors towards the firms, the local and sector-specific skill pool of workers, the vocational school, polytechnics and Centria. The success of the leading firms and the families around them has encouraged entrepreneurship within the interviewed firms.

In the electronics industry there seemed to be a sector specific (technological) local education and knowledge infrastructure (vocational school, technical college and Centria/research and development unit of the polytechnic), which had been utilized by almost every firm in the sector.

We found some elements of a "local innovation system" in the electronics industry, like a sector specific knowledge infrastructure, firms adapting the specific knowledge, and transfer mechanism (development projects, local development agencies, technology centers). However, this system is integrated in a bigger Northern Finland innovation system with a centre in Oulu.

The case on production of machinery and equipment for the fishing and aquaculture industry and development of technologies for fry production in Lofoten of Norway

In the case of manufacturing (aquaculture), the name of Lofoten has a symbolic significance, as the breeding ground of the Norwegian Arctic Cod. The aquaculture innovation system, however, is national. The local knowledge and competence base is systemic, in the sense that firms and people through their careers are combining different skills and forms of knowledge (science based, tacit and sticky). In terms of innovation activity the industry is serving a highly innovative customer. Norwegian fish-farming faces both technological and market challenges. The pressure for new innovations is hard. The innovation conditions in manufacturing are characterized by competing interests and conflicting strategies in the national innovation system. Within this context, the Lofilab strategy, which represents radical innovation related to development and manufacture of cod fry, is marginalized. The sector has clear innovation system features locally/regionally, and the system is linked to the national system. While the local/regional system learns from interactive learning between codified and practical knowledge, this type of learning seems to have worse conditions nationally. There is a need for stronger emphasis on interactive learning in national level innovation policy (the linear science-driven model has failed). There exists a formalized network organized at the national and regional level (ARENA), which has members in Lofoten among emerging cod producers. The network is promoting codified – codified relations, mostly between industrialists and the regional university in Bodø. There are also networks in Lofoten on an informal basis, where practitioners exchange information and experiences with cod production. The Lofilab national and international networks on cod fry production include national cod producers, financiers, and the national innovation system. This case provides us with an example of radical innovation in the periphery of Lofoten, supported by locally based key knowledge and competence components. The supporting innovation system is strongest in the national context. The configuration of the system is more directed towards traditional salmon breeding and salmon aquaculture than being supportive towards the radical innovation of cod fry.

The case on the wood and metal industry in Dalarna county of Sweden

The owners and managers of the small enterprises in Dalarna, which the study included, are typically "self-made men" with a long personal experience from the industry, but with little formal training. The key role of the individual entrepreneur/manager of the small firms in acquiring new knowledge and innovating products and processes is evident in all cases. Typically, also the current workforce has low formal education but often a long career as

skilled workers. The commitment of the companies' employees is mentioned as a key factor for competitiveness by most interviewees.

The machinery equipment, and the skill to operate and adjust it, constitutes an important competence base for many of these firms. Not seldom the equipment is unique for the particular firm at least in the region and hence a competitive advantage.

More or less all firms declare that firm renewal - introduction of new activities and new products – is a constantly ongoing process driven by the firm manager in direct contact with customers and suppliers. The key facilitators of incremental renewal are often the market agents for machinery equipment, and the banks. In one case, the manager had developed the firm from own innovation (computer system in metal industry) derived from own research. In this case the innovation is new for the world market. Some firms are innovative in terms of design and finish of the products, often developed in close contact with demanding customers.

Informal and person-to-person networks are by far the most important for innovative activity for the small firms in this sector. These networks link the manager with individuals: colleagues, suppliers, customers and sometimes experts at large companies with R&D capacity in relevant fields. Membership in branch organizations often leads to a general awareness of common challenges for the branch as such. There are several networks connected to the wood industry, which have been initiated spontaneously or with the support of national or EU programmes. Most firms have contacts and mainly positive experiences with the local municipality – both local politicians and business promotion agencies.

There is no general or common perception of the conditions for innovations in these industries, in Sweden or in the region. The local university is not very present in most of the interviewed firm managers' minds. Some say that there is a myth claiming that universities can create new products.

7.3 Final conclusions on the systemic aspect of innovations in the periphery

The ISP project has explored various aspects of the complex concept of innovation systems in a real life context of selected peripheral regions of the Nordic countries. Before presenting the general project conclusions on this multifaceted topic it is relevant to reaffirm the introduction of the concept of innovation systems (see the box below).

> The concept of *innovation system* has been developed to describe the systemic nature of innovations. It builds on the assumption that innovation is not only a result of, but also reliant on the interactions and knowledge transitions between different economic actors[410]. The term innovation system has been defined as a "**set of institutional actors and interactions, having as their ultimate goal the generation and adoption of innovations at some level of aggregation**"[411] (country, region, industry sector, etc.). The set of players, who represent the different elements of the system are believed to include firms, large and small, as well as various organizations such as universities and skill development organizations, research institutes, technology-transfer agencies, consultants and development agencies, public and private funding organizations and interest groups and membership organizations of various sorts. The interactions between these entities (elements) can take place in various ways. They can be described as flows of knowledge and information, flows of investment funding, flows of authority or leadership and even as more informal arrangements such as networks, associations, and partnerships.

Some evident differences were found in the systemic aspect of innovation processes in the 14 ISP cases. In most of the cases the systemic aspect, however, seems to be quite sector-oriented, rather than oriented towards a strictly defined geographical area (region and/or even country). From the overall findings of the ISP project, we therefore conclude that we should be very cautious of using the term *regional innovation systems* to describe the systemic aspect of the innovations found in the study areas. The following discussion elaborates further on the systemic aspect of innovation processes found in the ISP project.

The basic role of the systemic aspect in innovation processes

The existence of arenas for interactions between economic players that facilitate networking and partnerships and foster a climate of cooperation has been regarded as one of they key factors for the development of a successful regional innovation system[412]. The academic literature suggests that it is particularly important for economic players in rural areas to have strong and diversified networks in place for maximizing their capacity, creating stronger bargaining power and minimizing problems associated with location.

The findings of the ISP project indicate that innovations' dependence on interactions and knowledge transitions, between different economic players, varies greatly between the different examples of innovations studied. Most firms seem to rely strongly on their own initiative, and do generally communicate or cooperate with few selected players. Some firms, however, have a variety of interactions with different players. The systemic aspect is, therefore, in some instances fairly weak, but in other cases stronger.

[410] Gregersen and Johnson 1997; Lundvall 1992; Saviotti 1997.

[411] Saviotti 1997. p. 180.

[412] Cooke and Morgan, 1998; Gregersen and Johson, 1997.

As noted earlier, the bare existence of various support and service organizations, as well as the perceived effectiveness of these organizations influence the actual number of cooperative relationships, which firms can be expected to have with such organizations. This was quite evident when comparing the different cases of the ISP project, especially within the tourism sector, where some of the study areas enjoyed advanced policy and support service infrastructure while others did not. This relates to the discussion above on the importance of having effective arenas for interactions between the different economic players in place. This being said, the findings of the ISP project indicate that it should be stressed that a wide ranging cooperation relationships are not an absolute precondition for innovations to successfully take place. The number of cooperative relationships, which each firm has with other agents, is probably not what influences the innovation processes the most, but rather how well the established relationships are functioning[413].

The elements of the system and the type of interactions between them

It is relevant to ask: Who were the players representing the key elements of the systemic aspects of the innovations found in the ISP project? Before answering this question, it has to be firmly stressed that the different cases showed some level of variability in this context. However, a common trend across all cases was the relatively great importance of various horizontal networking relationships for innovation processes. “Firm to firm” relations seem to be very important and in some cases industry associations also play a key role. Also interactions with clients and suppliers seem both to produce new ideas (innovation drivers) as well as being important in the overall innovation process. Finally various personal contacts (schoolmates, family, neighbors, friends, colleagues, etc.) seem to be an important source for information, ideas and advice. Generally we can say that the players listed above, had a stronger role than various official support service providers. Also informal interactions seem to be more common than more formal ones.

Another important overall finding of the ISP project is the fact that, in most cases, research and development agencies as well as educational institutes seem to have an insignificant direct role in the innovation activities of the firms studied. At the same time the level of formal education within the firms (especially within the food industry and the tourism sector) is commonly fairly low. Also the firm representatives do neither put much emphasis on the need for new knowledge and competences, nor on the need for stronger linkages with R&D and educational institutes. Although formal scientific knowledge is only in minority of cases an important building block for the innovation activities found by the ISP project, it can be argued that there is a need for that kind of advanced knowledge, especially among the firms and industries that have reached a certain level of maturity and sophistication. However, based on the nature of innovation activities and the current status of the knowledge and competence base, it is reasonable to argue that the most evident need, in this context, is to improve the basic educational base and various practical skills, relevant to innovation activities of the types of firms studied in the ISP project. There is, therefore, without a doubt, a considerable room for a stronger role of institutes that focus on general capacity building. Such institutes have also an intermediary role, as elements of the system, in linking general capacity building efforts to formal overarching knowledge infrastructure.

[413] This is consisted with some previous findings on this topic in the rural context. See for example Murdoch, 2000.

In this regard it is also important to note that the term "knowledge infrastructure" must be understood in a broad sense, including various support agents (other than solely formal R&D institutes and universities) and various agents operating in the private domain and/or representing the private sector. In some regions of the Nordic countries efforts are already in the making aiming at strengthening the role of educational institutes (including universities) in capacity building within peripheral communities (e.g. activities of some regional universities in Sweden, and distance education programs offered by several universities in Iceland). The findings of the ISP project, however, indicate that there is further potential for collaboration and learning, among a broad range of actors, and that the strengthening of such efforts will eventually strengthen innovations in peripheral areas of the Nordic countries.

The level of aggregation

Within the *Innovations Systems Approach*, different types of systems have been defined. A distinction is made between systems which look at a specific industry sector or a specific technology as their starting point and systems which build on some kind of geographical proximity (local, regional, national, etc.). When reviewing the academic literature it is evident that the supporters of the former argue that systems of innovation are more technological than geographical. Those who support the latter emphasize that the local or regional proximity is the relevant context to study. The argument is that national systems may have been important in the past but, partly due to the increasing internationalization of most economic processes, they are losing out to local and regional systems.[414] The ISP project set out primarily from the latter angle, which was presented above. Hence, building on the assumption that an innovation system is a phenomenon that exists in certain geographical space and is shaped by the institutions, which influence economic and social life within that space. However, for the purpose of narrowing the focus of the project, the perspective of firms, within three selected industry sectors, where especially emphasized. In a way the project, therefore, also included a sectoral approach.

The key conclusion of the ISP project in this regard is that innovation systems are neither solely geographical phenomena nor solely sectoral phenomena. The real life appearance of innovation systems is much more complex than that. We have identified several types of the so-called systemic aspects of innovation processes. These systemic aspects take on various forms where the geographical and sectoral underpinnings and influences vary considerably and also blend together.

[414] See for example Gregersen and Johnson. 1997.

7.4 Policy recommendations

The ISP project has focused on the perspective of firms in selected industry sectors that are of key importance in peripheral areas in the Nordic countries. The findings of the project can contribute to our knowledge on how to plan for and implement strategies for innovation reinforcement in peripheral regions. Based on the previous sections of this report the ISP project offers the following policy recommendations.

a) Acknowledgement of innovations in the periphery

Through the ISP project process a number of examples of "good innovation practice" have been identified (see Appendix B for a set of "short stories" of how specific innovations have successfully taken place and/or have been facilitated in the chosen study areas). These examples demonstrate that in spite of some apparent disadvantages, associated with peripheral locations, innovation is possible and taking place in the Nordic periphery. Innovation, furthermore, commonly seems to be considered necessary to stay in business and in that way seems to be looked at as a survival strategy. This confirms that peripheral regions possess firms that already have acquired valuable experiences that they, and others, will be able to build on in the future. The innovations found by the ISP project, furthermore, indicate that peripheral regions are not necessarily handicapped in terms of innovative milieus as long as the institutional framework encourages entrepreneurship, competition, and capacity building among firms. It is important to disseminate these experiences to firms in Nordic peripheral areas for the purpose of properly acknowledging and promoting the examples of "good practice". *It is important that policy makers reflect positive attitudes towards the broad topic of innovation in peripheral regions, for the purpose of creating an encouraging spirit in rural communities. The examples found by the ISP project should strengthen such attitudes and encourage policy makers to take on a proactive approach aiming at facilitating innovation in rural regions.*

b) Utilization and evolution of rural ways of life for the purpose of creating innovative products

The knowledge and competence base, which was found in many of the cases (in particular the cases on tourism and agrifood production), includes various forms of traditional practical knowledge, which is interwoven with rural identities. This includes knowledge of social, economic, cultural, and natural/environmental aspects of rural communities. The ISP study shows that this type of knowledge has produced innovative products that appeal to a broad market. This being said, we have also found examples of "new-comers" to peripheral areas, who have been creative in mixing their experiences from other regions and countries with local assets. *The findings of the ISP project, therefore, indicate that the rural ways of life can be a source for innovations. Policy makers should acknowledge and strengthen the utilization of this source by creating specific measures (support programs, development projects). Such measures should aim at generating opportunities for innovators to utilize local assets in product development and marketing efforts and thereby effectively draw from this source.*

c) Transparency of policy- and official support schemes

Many of the ISP cases show that policy, and in some instances associated support services, are not visible enough to the firms participating in the ISP exercise. Limited awareness, lack of familiarity, and in some instances limited confidence towards the whole system of innovation facilitation, commonly seem to characterize the firm representatives' views. In at least some cases it, therefore, seems to be a gap between the official systems and the perceptions and needs of firms. It can be argued that in some instances this is partly due to the limited attention innovation policy has paid to traditional and mature industry sectors (e.g. agrifood production). In other cases this has more to do with the lack of transparency and effectiveness of the system. The policy challenge ahead includes an emphasis on integrating traditional industries into national and supranational innovation facilitation systems. This implies, above all, a need for adjusting the existing, dominating rationales for policy measures, which can be summed up to strongly support technological and science-based innovation. The needed adjustment is in the direction of acknowledging non-science based knowledge as an input to innovation. It is also necessary to ensure that policy spills effectively into the support programs, not only at the national level, but also at the regional and local levels. There is, therefore, a strong need for local and regional innovation facilitators. These agents have an important role in facilitating local trust towards the overarching system. They also have an intermediary role in making policy, and associated measures, visible and accessible to firms in the periphery, as well as in connecting firms with physically distant knowledge producers and other service providers. *As indicated above, policy makers should emphasize making policy and official support schemes more readable, applicable and visible to end-users. An emphasis should be put on the local level in this context. Such an emphasis should be an evident part of the public relation (PR) role of official support organizations, where the goal should not only be to create a positive image, but merely an operational, approachable and well-functioning policy and support system.*

d) Dissolving "sectoral lock-in"

The ISP findings indicate that in some Nordic regions certain industry sectors can be considered quite isolated from other aspects of economic life in the regions studied. This especially applies to the agrifood sector. This isolation, which can be referred to as a "sectoral lock-in", presents itself through the structure of supporting services (including those focusing on knowledge and competence building), networking patterns of firms, involvement of support agents in cross-sectoral development initiatives, etc. It seems realistic to predict that future innovations within farming and food processing will to a greater extent, focus on alternative forms, i.e. be outside the conventional norms of the agrifood industry (e.g. value-added production, including "on-farm" processing and sales, niche production and marketing, farm-based tourism activities, etc.). It can be argued that this focus could greatly benefit from closer relations to other specific industry sectors (e.g. tourism) as well as from various other cross-sectoral interaction and cooperation (e.g. in relation to branding). This message is important both for the operation of firms and support agents. *The ISP findings, therefore, indicate that there is a need to put a greater emphasis on cross-sectoral thinking and interaction in policy making. Such cross-sectoral policy approach should be accompanied by practical implementation efforts in the form of concrete programmes or projects, aiming at better utilizing underexploited opportunities for innovations.*

e) Extending the knowledge and competence base

Although various valuable types of knowledge and competences were found across the ISP cases, it can be argued that improvement of the basic knowledge and competence base, of the firms studied, could contribute to the innovation potentials of these firms and the regions they operate in. Given the nature of innovation activities and the current status of the knowledge and competence base found by the project, there is a need for general capacity building with a focus on various practical skills, relevant to innovation activities. Although general capacity building can be viewed as the primary need in this context, we can also argue that there is a need for improving the stock of formal advanced knowledge, especially among the firms and industries that have reached a certain level of maturity and sophistication. *Policy makers should, therefore, aim at to strengthening the role of educational institutes within peripheral regions, especially their input and involvement in various general capacity building efforts. Such involvement can for example be in the form of cooperative projects including partners from local/regional development groups or agencies, or in the form of specific educational programs or courses specially targeting relevant knowledge areas. In the design of such measures a broad range of educational institutes should have a role and unconventional institutes/players should be included in the design of sector-specific measures (see previous discussion on the need for dissolving "sectoral lock-in").*

f) Facilitating entrepreneurial culture

The ISP project has found examples of innovative firms, which are lead by champions of entrepreneurship. Some of these persons have carried out their innovations, without much interactions or contributions from support programs of any sort. For these firms entrepreneurial spirit seems to be the main driver for innovation, accompanied by a great level of determination and extensive work output. These examples show that entrepreneurial driving force can move mountains. It is also reasonable to argue that without at least a certain level of such a driving force, sophisticated innovation facilitation systems have an insignificant meaning. In spite of increased activities in some Nordic regions (e.g. in Sweden) to promote entrepreneurial spirit and skills, particularly among selected community groups, *the above finding of the ISP project, contains an important lesson for policy makers. This lesson predicts that policy makers should be able to step out of the customary discussion on strategies, programs, services, etc. Policy makers should also consider initiatives that build on introverted approaches to community economic development, aiming at general capacity building and raising the motivation and self-confidence of potential innovators (e.g. therapeutic programs for encouraging positive or proactive thinking or constructive identity building). Such approaches should target different community groups, including different age groups, genders, ethnic groups etc.*

g) Making better use of existing networks

The great importance of various horizontal networking relationships for innovation processes is a clear and consistent finding from the ISP project. "Firm to firm" relations seem to be a very important part of the systemic aspect of innovation processes, as well as firms' interactions with industry associations, clients and suppliers. Partnerships based on a common commercial vision, a local or regional branding and guided by good local leadership have proved to be important. The policy mandate, in this context, should be to facilitate even better

use of these existing networks. We should acknowledge the importance of these players, both industry associations and representatives of the private sectors, and ask how they can be better integrated into innovation facilitation systems. *Policy makers should, therefore, aim at giving the above mentioned players a stronger role in policy processes as well as strengthening their concrete role in the design and implementation of policy measures through specific support programs and development projects (strengthening of public/private partnerships).*

h) Framework conditions and problems of peripherality

The findings of the ISP project indicate that when discussing the topic of innovation in the periphery the general framework conditions, within each country's economic environment, greatly influence innovation potentials and processes. Some of the firm representatives, who contributed to the ISP project, were very much concerned with the basic national conditions for running a business (e.g. tax- and labour regulations). The ISP findings also show that the basic challenges associated with peripheral locations do, to a varying degree, affect innovation activities of the firms studied. Challenges associated with geographical distances, for instance, influence firms' access to new specialized knowledge and services, access to labour force with specific qualifications, small regional markets can limit firm networks and expansion opportunities, etc. These hindering factors are especially difficult to overcome for entrepreneurs and small firms, which are early in their business cycle. *Strengthening the overall framework conditions for business competitiveness and innovation is a never-ending policy challenge both in the rural and urban context. An important lesson for policy makers from the periphery-specific discussion above, however, is the importance of acknowledging that efforts to facilitate innovations and economic development of peripheral regions should not happen in isolation from other more general regional/(rural) development efforts (and vice versa). Here efforts and support to collective capacity building an innovative measures rather than support to individuals and individual firms should be emphasized (LEADER-like approach). This calls especially for the attention of policy makers, which operate on national and supranational levels.*

i) Need for continuing research

All of the previous recommendations call for continuing research of the issues of which the recommendations deal with. In this context it is important to note that research within innovation studies has generally not focused on the economic realities of rural regions and small centers in peripheral regions. The ISP project has primarily focused on the perspective of firms in peripheral locations, rather than on the overall perspective of localities, regions, and intermediate policy systems. There is, therefore, a considerable need for more data gathering and analysis in this field of innovation studies. There is, for instance, a great need for models for local and regional innovation policy, which are not primarily focusing on sectors that greatly rely on advanced technologies and science based research and development. It is also important to explore in depth various general issues of community development and capacity building, and to link those issues with the context of innovation facilitation in the periphery. In further research, the differential cultural, economic and institutional settings in the Nordic countries should be emphasized for the purpose of contributing to cross-national and cross regional learning. *The above contains an important message for policy makers. It is important that policy makers acknowledge that policy*

measures and other development efforts, which aim at facilitating innovation, call for careful planning, careful design, as well as for an extensive gathering of relevant information. Such tasks evidently should be built on professional research.

7.5 References

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Appendix A: Research context summaries

Research context of the Danish contribution to the ISP project			
General profile of the study area			
Name of study area/region	Ringkoebing County and Viborg County		
Size of study area/region (km^2)	8.976 km^2		
Main districts or no. of municipalities	35 municipalities in all (18 in Ringkoebing County and 17 in Viborg County)		
Current population number	509.489 inhabitants		
Recent development of population number	3.1% increase (1.1.1998-1.1.2004)		
% of population living in rural settings	As of 1.1.2004: 62% of the population were living in municipalities with less than 100 inhabitants pr. km^2. (55% and 70% in Ringkoebing C. and Viborg C., respectively).		
Main urban centers and their population number	Biggest towns in Ringkoebing C.: Holstebro (31.808 inhabitants), Herning (29.945). Viborg C: Viborg (33.192) Skive (20.676)		
Employment by economic sectors	2003: 7% in primary production, 34% in industry, 59% in services. Building and construction (7%) is entered under industry. In services (59%), strict service trades account for 29% and the remaining 30% mainly consists of public services (e.g. schools and care homes etc.).		
The area's "economic background":	Higher share of primary production and manufacturing than the rest of Denmark.		
Coverage of innovation and entrepreneurship in key policy documents:	<u>No. of documents</u>	<u>Extent of covering</u>	<u>Focus</u>
Supranational level	few/some/many	deep/mod./shallow	broad/sectoral
National level	some	shallow	broad
Regional/local level	some	moderate	broad-sectoral
	some	moderate	broad-sectoral
Agrifood production in the study area (the branches chosen)			
Branches that the study focused on	Dairies and beer breweries		
Main products produced in the region within the branches chosen	Dairy products. Beer (and possibly also soft drinks).		
Structure of the value chain, which links are operating in the region?	Suppliers, farmers, processing firms, distributors and marketing bodies are all operation in the region.		
Primary production (farming)			
Number of farms and recent development of it	Total number of farms in Viborg and Ringkoebing counties: 10.236 (2003), 16.133 (1993). Decline 1993-2003: 37%.		
Average size of farms and recent development of it	Average size of farms in Viborg and Ringkoebing counties: 54 hectares (2003), 35 hectares (1993). Growth 1993-2003: 54%.		
Production quantities and recent development of it	1. Production of grain (wheat, barley, rye, oats) in two counties: 1598 million kg (2003), 1347 million kg (1993). Growth 1993-2003: 19%. 2. Stock of milking cows in two countries: 163.020 (2003), 192.143 (1993). Decline 93-03: 15%. Caused by rationalization, milk production unchanged in same period.		
Proportional share of the area in national production	1. Production of grain in the two counties in percentage of national production: 18% (2003), 16% (1993). 2. Stock of milking cows in the two countries in percentage of national stock: 27% (2003), 27% (1993).		
Processing, distribution and marketing			
Number of processing operations/firms	5 within brewery industry (4 breweries, 1 malt factory), 13 operations/firms within dairy industry (2004).		
Most common size of firms (man years)	Brewery industry: 2 microbreweries, the rest have 25-35 employees. Dairy industry: mostly more than 100 employees.		
Total turnover of the chosen industry branches	Information not available.		

Recent trends within the industry branches (scale)	Two directions: Scale and niche.	
Markets, where are products primarily sold?	Local, regional, national, international.	
Presence in the region, and official role of the following, in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	W	-----
Government or private non-profit research institutes	M	-----
Commercial laboratories /R&D enterprises	W	-----
Public regulatory authorities	M	-----
Development agencies and business consultants/experts	M	-----
Industry associations and/or professional networks	W	-----
Interest groups and/or public sphere movements	M	-----
Financial institutions/actors	-----	-----
Tourism in the study area		
Number of firms (all / those offering recreational services)	Information not available.	
Number of overnight stays in the year 2003 and recent development of it	Ringkoebing County: 4,7 million (2003). Development 1998-2003: 6% increase. Viborg County: 1,8 million (2003). Development 1998-2003: 9% decrease.	
Proportional share in overnight stays in the country as a whole (2003)	15% (Denmark has a total of app. 43 million overnight stays in 2003.)	
Most common service (product) types	Coastal tourism: Family-oriented summer houses	
Most common size of firms (man years)	Micro enterprises: less than 10 employees.	
Market/clients (division between domestic and foreign visitors)	2003, overnight stays Ringkoebing C.: 4735724 in all, 3705419 foreigners (78%) Viborg C.: 1793363 in all, 806736 foreigners (45%) Total percentage in study area: 69%	
Characteristics of service and marketing systems: which links exist within the region?	All links exist, e.g. service operations, sales, marketing, etc.	
Presence and official role of the following in innovation facilitation	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	W	-----
Government or private non-profit research institutes	M	-----
Commercial laboratories /R&D enterprises	W	-----
Public regulatory authorities	M	-----
Development agencies and business consultants/experts	M	-----
Industry associations and/or professional networks	M	-----
Interest groups and/or public sphere movements	M	-----
Financial institutions/actors	M	-----
Manufacturing in the study area (the branches chosen)		
Branches that the study focused on	Furniture industry	
Main products produced in the region within the branches chosen	Varied end products: knockdown and designer furniture.	
Structure of the value chain, which links are operating in the region?	Mainly production firms.	
Number of operations/firms	100 companies and related industries in the Salling region with Salling area as the centre with 38 companies.	
Total turnover of the industry	Annual turnover app. 4 billion and 3 billion from exports (2001)	
Proportional share of the area in the national production within the chosen branches	Low estimate, 15% of the annual turnover in Danish furniture industry (2001)	
Recent trends within the chosen industry branches (scale)	Employment 2700 persons (2001), growth by 50% 1984-1993. Now, the mature cluster faces stagnation.	
Markets, where are products primarily sold?	Germany, England, Sweden, Norway, US.	

Presence and official role of the following in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	M	-----
Government or private non-profit research institutes	M	-----
Commercial laboratories /R&D enterprises	W	-----
Public regulatory authorities	M	-----
Development agencies and business consultants/experts	M	-----
Industry associations and/or professional networks	M	-----
Interest groups and/or public sphere movements	W	-----
Financial institutions/actors	W/M	-----

Research context of the Finnish contribution to the ISP project The region of Central Ostrobothnia; food industry and tourism	
General profile of the study area	
Name of study area/region	The region of Central Ostrobothnia
Size of study area/region (km^2)	Total 5 474 km2, land area 5 285 km2
Main districts and no. of municipalities	2 subregions and 12 municipalities The subregion of Kokkola (5 municipalities) The subregion of Kaustinen (7 municipalities)
Current population number	70 584 inhabitants (12/ 2003)
Recent development of population number	in 1980 68 091 inhabitants, in 1990 71 567 inhabitants, in 2000 71 292 inhabitants
% of population living in rural settings (outside "tätort"/community of houses with at least 200 inhabitants and with distance between houses no more than 200 metres)	The region of Central Ostrobothnia: 24 % The subregion of Kokkola: 14 % The subregion of Kaustinen: 52 %
Main urban centers and their population number	Kokkola, 35 756 inhabitants (12/2003), no other urban centres
Employment by economic sectors in 2002 Source: Kuntafakta, Statistics Finland	the Kokkola subregion: 6,7 % in primary production 28,4 % in industry 12,5 % in trade 2,2 % in accommodation and food services 6,9 % in transport 8,3 % in private services 27,6 % in public services 7,3 % other on unknown the Kaustinen subregion: 24,6 % in primary production 24,0 % in industry 7,0 % in trade 1,6 % in accommodation and food services 5,7 % in transport 4,7 % in private services 23,5 % in public services 8,9 % other on unknown
The area's "economic background":	Which are the main traditional sectors? The Kokkola subregion: chemical industry; manufacturing of basic metals; food industry; retailing; agriculture; land transport; boat industry; textile, clothing and leather industry The Kaustinen subregion: agriculture, wood industry, metal industry

Coverage of innovation and entrepreneurship in key policy documents:	No. of documents	Extent of covering	Focus
	few/some/many	deep/mod./shallow	broad/sectoral
Supranational level	many	deep/ mod	br/sect
National level	many	deep/mod	br/sect
Regional/local level	many	deep/mod	br/sect
Agrifood production in the study area (the branches chosen)			
Branches that the study focused on	Dairy production and processing (farms and dairies), root crops processing, potato processing, berry processing, spring water bottling, mill, wine		
Main products produced in the region within the branches chosen	Milk, different milk products, root crops and potato products, berry products, bottles of water, mill products, wine etc.		
Structure of the value chain, which links are operating in the region?	Majority of the suppliers, farmers, and processing firms are operating in the region. Some of the distributors, marketing bodies etc. are operating in the region, some of them elsewhere in the country.		
Primary production (farming)[415]			
Number of farms and recent development of it	1 259 farms (63 % of them dairy farms) in 2002, number of farms has been diminishing		
Average size of farms and recent development of it	Average area of arable land 29,2 ha in 2001, increasing		
Production quantities and recent development of it	Central Ostrobothnia is one of the regions where milk farming is concentrated in the country and the amount of produced milk in the region increased by 20 per cent in 1995-2000		
Proportional share of the area in national production	- - -		
Processing, distribution and marketing[416]			
Number of processing operations/firms	44 places of business in 2002 66 enterprises according to Food Finland		
Employment in the industry	822 employees in 2002		
Total turnover in the food processing firms	The gross value of production 179 million euros in 2002		
Recent trends within the industry branches (scale)	- - -		
Markets, where are products primarily sold?	Nationally, regionally		
Presence in the region, and official role of the following, in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong	
Universities or other education institutes	m		
Government or private non-profit research institutes	w		
Commercial laboratories /R&D enterprises	m		
Public regulatory authorities	m/s		
Development agencies and business consultants/experts	m/s		
Industry associations and/or professional networks	m/s		
Interest groups and/or public sphere movements	m/s		
Financial institutions/actors	m		
Tourism in the study area			
Number of firms in food and accommodation services	152		
Number of overnight stays in the year 2003 and recent development of it	131 561 overnight stays at accommodation facilities in 2003 (140 122 in 2002)		
Proportional share in overnight stays in the country as a whole (2003)	0,82 per cent of the total overnight stays (16 081 812) in the whole country		
Most common service (product) types	Accommodation and food services, recreational services		
Most common size of firms (man years)	- - -		

[415] The figures include all the farms (all the branches in farming) in the region.

[416] The figures include all the food industry (primary production not included) that is all the branches in the food industry in the region.

Market/clients (division between domestic and foreign visitors)	Foreign visitors approx. 9 per cent of the overnight stays at accommodation facilities in 2003	
Characteristics of service and marketing systems: which links exist within the region?	Existence of joint marketing, sales and development in tourism is weak in the region as a whole	
Presence and official role of the following in innovation facilitation	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	w	
Government or private non-profit research institutes	w	
Commercial laboratories /R&D enterprises	w	
Public regulatory authorities	m	
Development agencies and business consultants/experts	m	
Industry associations and/or professional networks	m	
Interest groups and/or public sphere movements	m	
Financial institutions/actors	m	

Research context of the region of Oulu South: manufacturing

General profile of the study area

Name of study area/region	Oulu South
Size of study area/region (km^2)	Total 11278 km2, the land area 10913 km2
Main districts and no. of municipalities	3 subregions and 17 municipalities The subregion of Nivala-Haapajärvi (5 municipalities) The subregion of Siikalatva (6 municipalities) The subregion of Ylivieska (6 municipalities)
Current population number	87 993 inhabitants in 2003
Recent development of population number	In 1980 88 000 inhabitants, in 1990 92725 inhabitants, In 2000 89618 inhabitants and in 2003 87993 inhabitants Since 1995 population decreases in all subregions.
% of population living in rural settings (Outside "tätort"/community of houses with at least 200 inhabitants and with distance between houses not more than 200 meters)	Subregion of Nivala-Haapajärvi: 36 % Subregion of Siikalatva: 41% Subregion of Ylivieska: 25 %
Main urban centers and their population number	No urban centres, 6 semi urban municipalities: Haapavesi, Haapajärvi, Kalajoki, Oulainen, Nivala and Ylivieska, 11 rural municipalities. Ylivieska is the biggest municipality with 13 185 inhabitants in 2003.
Employment by economic sectors in 2002	The Nivala-Haapajärvi subregion: 19,8 % in primary production, 26,6 % in industry, 19,9 % in private services 26,3 % in public services 7,4 other or unknown profession The Siikalatva region: 19,8 % in primary production, 24,4 % in industry, 21,7 % in private services 27,4 % in public services 6,8 other or unknown profession The Ylivieska subregion: 12,1 % in primary production, 30,2 % in industry, 25,2 % in private services 26,4 % in public services 6,2 other or unknown profession
The area's "economic background":	Which are the main traditional sectors? Agriculture (mostly dairy production); mechanical wood industry; small metal workshops; food industry

Coverage of innovation and entrepreneurship in key policy documents:	No. of documents few/some/many	Extent of covering deep/mod./shallow	Focus broad/sectoral
Supranational level	many	deep/mod	br/sect
National level	many	deep/mod	br/sect
Regional/local level	many	deep/mod	br/sect

Manufacturing in the study area (the branches chosen)		
Branches that the study focused on	Electronics and electrotechnical industry, mostly related to telecommunication and wireless technology; other industrial electronics	
Main products produced in the region within the branches chosen	Manufacturing sheets used in telecommunication sector; other product of industrial electronics	
Structure of the value chain, which links are operating in the region?	Suppliers and subcontractors, production planning, automation planning. Firms linked to the national ICT cluster	
Number of operations/firms	35 firms in electronics and electromechanical industry	
Total turnover of the industry	- - -	
Proportional share of the area in the national production within the chosen branches	About the half of the production of the manufacturing sheets related to networks of telecommunication in Finland (thin plate industry)	
Recent trends within the chosen industry branches (scale)	Outsourcing creating opportunities, global competition, high productivity increases.	
Markets, where are products primarily sold?	Nokia Network (a unit of Nokia company) located in Oulu, other clients in the industrial network	
Presence and official role of the following in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities	w	-----
Other education institutes: polytechnic vocational school	s	-----
Commercial laboratories /R&D enterprises	m-	-----
Public regulatory authorities	w-	-----
Development agencies and business consultants/experts:	--	--
Industry associations and/or professional networks	s	-----
Interest groups and/or public sphere movements	m	-----
Financial institutions/actors	m	-----

Research context of the Icelandic contribution to the ISP project

General profile of the study area

Name of study area/region	Northwest region (Norðurland vestra)
Size of study area/region (km^2)	Approximately 12.000 km^2
Main districts or no. of municipalities	Two main districts: 1) East and West Húnavatnssýsla district, 2) Skagafjörður district. Together including 12 municipalities
Current population number	9.151 (Dec. 2003, source: Statistics Iceland)
Recent development of population number	14% decrease since 1980
% of population living in rural settings	The region includes five small urban communities, which together account for 67% of the population, the rest of the population (33%) lives in rural settings
Main urban centers and their population number	Sauðárkrókur (approx. 2600), Siglufjörður (approx. 1440), Blönduós (approx. 890), Skagaströnd (approx. 590), Hvammstangi (approx. 580)
Employment by economic sectors	Primary production: Agriculture (11%), fishing (5%) Industry/manufacturing: Fish processing (8%), other manufacturing (10%) Electricity & water supply and construction (8%) Various services (56%) *Statistics Iceland (2004)*
The area's "economic background":	The region is in a traditional sense a food production region, both seafood and agrifood.

Coverage of innovation and entrepreneurship in key policy documents:	No. of documents few/some/many	Extent of covering deep/mod./shallow	Focus broad/sectoral
National level	some	mod.	broad
Regional/local level	few	mod.	broad

Agrifood production in the study area (the branches chosen)

Note: The study area in this case is defined as Skagafjörður district an the Eastern part of Húnavatnssýsla district

Branches that the study focused on	Milk production and the dairy industry
Main products produced in the region within the branches chosen	Several types of cheese, flavored sour milk, fresh milk and cream, milk powder, butter, skyr (a special yogurt like product)
Structure of the value chain, which links are operating in the region?	Farmers, processing firms.
Primary production (farming)	
Number of farms and recent development of it	94 dairy farms (June 2004), the number has gone somewhat down in recent years
Average size of farms and recent development of it	29 cows, annual production of roughly 155.000 liters (2003) The average size of farms has been increasing in recent years.
Production quantities and recent development of it	14.597.000 liters of milk in 2003, 27% increase since 1993
Proportional share of the area in national production	13 % of national production in 2003
Processing, distribution and marketing	
Number of processing operations/firms	Two
Most common size of firms (man years)	Around 10 man-years
Total turnover of the chosen industry branches	1.200 millions ISK. *Exchange rate: ISK / 87 = Euros.*
Recent trends within the industry branches (scale)	Increased turnover of the industry in recent years, especially in Skagafjörður district.
Markets, where are products primarily sold?	Regionally and nationally

Presence in the region, and official role of the following, in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	weak	weak
Government or private non-profit research institutes	weak	weak
Commercial laboratories /R&D enterprises	weak	weak
Public regulatory authorities	moderate	weak-moderate
Development agencies and business consultants/experts	strong	moderate
Industry associations and/or professional networks	farming/s, processing/w	strong
Interest groups and/or public sphere movements	farming/s, processing/m	farming/s, processing/m
Financial institutions/actors	moderate	moderate
Tourism in the study area		
Number of firms	The Icelandic Tourist Board Registry includes around 115 tourism firms located in the Northwest region, the Board's register is, however, not fully exhaustive.	
Number of overnight stays in the year 2003 and recent development of it	69.053 in 2003, (5,1% increase from previous year)	
Proportional share in overnight stays in the country as a whole (2003)	3,5%	
Most common service (product) types	Broad product range, e.g. food and accommodation services, as well as various recreational services, i.e. salmon and trout fishing, activities associated with horseback riding and the Icelandic horse, several museums and cultural activities	
Most common size of firms (man years)	No comprehensive statistics, most firms are small family-run operations that hire some extra summer employees.	
Market/clients (division between foreign and domestic visitors)	Close to 50% og the overnight stays sold in 2003 were bought by foreign visitors and 50% were bought by Icelanders.	
Characteristics of service and marketing systems: which links exist within the region?	A considerable number of private tourism firms, but few common marketing bodies, exist within the region Quite a few support service agents operate within the region.	
Presence and official role of the following in innovation facilitation	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	moderate-strong	moderate-strong
Government or private non-profit research institutes	moderate	moderate
Commercial laboratories /R&D enterprises	weak	weak
Public regulatory authorities	moderate	weak
Development agencies and business consultants/experts	moderate	strong
Industry associations and/or professional networks	weak	moderate
Interest groups and/or public sphere movements	weak-moderate	moderate
Financial institutions/actors	moderate	moderate

Research context of the Norwegian contribution to the ISP project

General profile of the study area

Name of study area/region	Lofoten		
Size of study area/region (km^2)	1227 km2		
Main districts or no. of municipalities	6 municipalities		
Current population number	Ca. 25 000		
Recent development of population number	Status quo		
% of population living in rural settings	Ca. 60%		
Main urban centers and their population number	Svolvær (5000 -6000)		
Employment by economic sectors	-----		
The area's "economic background":	Fisheries and agriculture are the main traditional sectors		
Coverage of innovation and entrepreneurship in key policy documents:	No. of documents few/some/many	Extent of covering deep/mod./shallow	Focus broad/sectoral
Supranational level	None		
National level	Some	Mod	Broad
Regional/local level	Many	Mod	Sectoral

Agrifood production in the study area (the branches chosen)

Branches that the study focused on	Milk, dairy, meat (and fish)
Main products produced in the region within the branches chosen	Milk, cheese, young goat meat
Structure of the value chain, which links are operating in the region?	The suppliers and farmers are working well. There are not many processing firms in the region and few distributors and marketing bodies.
Primary production (farming)	
Number of farms and recent development of it	In 1959 there were 1 544 farms in Vestvågøy, This was reduced to 373 in 1989 and further reduced to 225 in1999 and 199 in 2002.
Average size of farms and recent development of it	Milk Cows: The number of farms with over 15 animals is increasing, but still over 30 % of the farms have less than 10 animals and over 55 % have less than 15 animals. From 1999 to 2001, 16 milk farms were closed down, and most of them were farms with number of milk cows between 10-14 animals. Milk Goats: Average goats per farm is approximately 50 and this has been pretty stable the recent years
Production quantities and recent development of it	In 2002, 360 524 liter milk was produced in Vestvågøy and this has been rather stable the last years
Proportional share of the area in national production	-------
Processing, distribution and marketing	
Number of processing operations/firms	----
Most common size of firms (man years)	----
Total turnover of the chosen industry branches	----
Recent trends within the industry branches (scale)	----
Markets, where are products primarily sold?	----

Presence in the region, and official role of the following, in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	Weak	Strong
Government or private non-profit research institutes	Weak	Strong
Commercial laboratories /R&D enterprises	Weak	Moderate
Public regulatory authorities	Strong	Strong
Development agencies and business consultants/experts	Moderate	Moderate
Industry associations and/or professional networks	Moderate	Moderate
Interest groups and/or public sphere movements	Moderate	Strong
Financial institutions/actors	Weak	Weak
Tourism in the study area		
Number of firms (all / those offering recreational services)	------	
Number of overnight stays in the year 2003 and recent development of it	Ca.230 000, increasing	
Proportional share in overnight stays in the country as a whole (2003)	1,7 %	
Most common service (product) types	Traditional accommodation (Fishermen's cabins) is the most common type of tourism services in the study area?	
Most common size of firms (man years)	Family firms (1-3)	
Market/clients (division between domestic and foreign visitors)	Not known, probably slightly more domestic tourists than foreign	
Characteristics of service and marketing systems: which links exist within the region?	Service operations, sales, marketing, etc. Destination company with overall responsibility, coordination, marketing, networking development	
Presence and official role of the following in innovation facilitation	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	Weak	Weak
Government or private non-profit research institutes	Weak	Weak
Commercial laboratories /R&D enterprises	Weak	Weak
Public regulatory authorities	Strong	Moderate/strong
Development agencies and business consultants/experts	Strong	Moderate/strong
Industry associations and/or professional networks	Strong	Strong
Interest groups and/or public sphere movements	Strong	Strong
Financial institutions/actors	Strong	Moderate
Manufacturing in the study area (the branches chosen)		
Branches that the study focused on	Cod aquaculture	
Main products produced in the region within the branches chosen	Cod, cod fry	
Structure of the value chain, which links are operating in the region?	Breeding - fry production – Cod production	
Number of operations/firms	Fry: 1 Cod: 4	
Total turnover of the industry	Fry: highly variable. This year: 15 000 fry, break even at 600 000,sold at NOK 10-12 each Cod production is starting up – no export figures as yet	
Proportional share of the area in the national production within the chosen branches	30% of fry nationally	
Recent trends within the chosen industry branches (scale)	Deep crisis	
Markets, where are products primarily sold?	Fry: national market Cod: export	

Presence and official role of the following in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	---weak--	--strong---
Government or private non-profit research institutes	--strong---	-strong----
Commercial laboratories /R&D enterprises	---core role--	-absent----
Public regulatory authorities	--weak---	--weak---
Development agencies and business consultants/experts	--strong---	--strong---
Industry associations and/or professional networks	--strong---	-strong----
Interest groups and/or public sphere movements	--weak---	--weak---
Financial institutions/actors	--moderate---	--moderate---

Research context of the Swedish contribution to the ISP project

General profile of the study area

Name of study area/region	Dalarna		
Size of study area/region (km^2)	About 28 000 km²		
Main districts or no. of municipalities	15 municipalities		
Current population number	276 520 inhabitants (in 2003) About 3% of Swedish population		
Recent development of population number	About 3-4% population decrease between 1980-2003		
% of population living in rural settings	52 % of population live outside the five main urban centers in Dalarna (in 2001)		
Main urban centers and their population number	Falun (54 000), Borlänge (26 000), Mora (20 000), Leksand (15 000), Hedemora (15 000). Source: Statistics Sweden (in 2001)		
Employment by economic sectors	Manufacturing (20%), Care (20%), Trade/Communication (16%), Private services - including tourism (16%), Agriculture (about 3%) in Dalarna (in year 2000)		
The area's "economic background":	Steel industry, forestry and public service sectors		
Coverage of innovation and entrepreneurship in key policy documents:	No. of documents few/some/many	Extent of covering deep/mod./shallow	Focus broad/sectoral
Supranational level	many	moderate	broad
National level	many	moderate	both
Regional/local level	many	moderate	both

Agrifood production in the study area (the branches chosen)

Branches that the study focused on	Processing of crops and meat products
Main products produced in the region within the branches chosen	Bread products, grained seed (flour), meat products, vegetarian fast food
Structure of the value chain, which links are operating in the region?	Suppliers (but also suppliers abroad), farmers, processing firms, distributors, marketing bodies
Primary production (farming)	
Number of farms and recent development of it	Dalarna had 2087 agricultural companies (farms) in 2003. Employment in agriculture, forestry, hunting and fishing about 2,7% (in end of 2003) compared to 4,2% (in end of 1993) of total employment in the region of Dalarna.
Average size of farms	Over one third (36%) of farms in Dalarna have a size of 10 ha (or less) and 20 % have a size between 10-20 ha
Production quantities Crops: tones (in 2003) Animal farming: number of animals (in 2001)	Crops: Winter wheat (3900), Spring barley (44 500), Oat (18100), Potatoes (18200) Animal farming: 5 600 pigs, 12 500 sheep, 11 000 milk cows, 4 000 cows for calf rearing

Proportional share of the area in national production	Crops: Winter wheat (0,2%), Spring barley (2,9%), Oat (1,6%), Potatoes (3,2%) Animal farming: Pigs (0,5%), Sheep (2,8%), milk cows (2,6%), cows for calf rearing (2,3%)	
Processing, distribution and marketing		
Number of processing operations/firms	No comprehensive statistics	
Most common size of firms (man years)	No comprehensive statistics	
Total turnover of the chosen industry branches	No comprehensive statistics	
Recent trends within the industry branches (scale)	No comprehensive statistics	
Markets, where are products primarily sold?	Local/regional and national, less export outside Sweden	
Presence in the region, and official role of the following, in innovation facilitation in the chosen branches	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	Moderate	Moderate
Government or private non-profit research institutes	Moderate	Moderate
Commercial laboratories /R&D enterprises	Weak	Weak
Public regulatory authorities	Moderate	Moderate
Development agencies and business consultants/experts	Strong	Strong
Industry associations and/or professional networks	Strong	Strong
Interest groups and/or public sphere movements	Strong	Strong
Financial institutions/actors	Moderate	Moderate
Tourism in the study area		
Number of firms (all / those offering recreational services)	42% of personnel working in the tourism industry are employed in hotel and restaurant sector and less than 10% are working in the sector described as culture, recreation and sports (in 2002)	
Number of overnight stays in the year 2003 and recent development of it	3,4 million overnight stays (in 2001) Tourism industry about 2,5% of GDP (in 2003)	
Proportional share in overnight stays in the country as a whole (2003)	Dalarna accounts for about 8% of all overnight stays in Sweden	
Most common service (product) types	Winter tourism (skiing), cultural heritage and events industry	
Most common size of firms (man years)	No comprehensive statistics available	
Market/clients (division between domestic and foreign visitors)	About 80 % of visitors in Dalarna are Swedish	
Characteristics of service and marketing systems: which links exist within the region?	Service operations, sales, local and regional networks for joint marketing of Dalarna	
Presence and official role of the following in innovation facilitation	Presence Weak/moderate/strong	Official role Weak/moderate/strong
Universities or other education institutes	Strong	Strong
Government or private non-profit research institutes	Moderate	Moderate
Commercial laboratories /R&D enterprises	Weak	Weak
Public regulatory authorities	Weak	Weak
Development agencies and business consultants/experts	Moderate	Moderate
Industry associations and/or professional networks	Strong	Strong
Interest groups and/or public sphere movements	Strong	Strong
Financial institutions/actors	Weak	Weak
Manufacturing in the study area (the branches chosen)		
Branches that the study focused on	Steel industry light scale manufacturing and wood cluster (composite materials etc)	
Main products produced in the region within the branches chosen	Equipment suppliers to specialized customers (engineering machine shops, motor cars, forest industry etc.)	
Structure of the value chain, which links are operating in the region?	Suppliers, production firms, distributors	

Number of operations/firms	Manufacturing employs about 25 000 persons in Dalarna according to the labour market outlook for 2004. Employment in the engineering industry (verkstadsindustri) 8,6% (in end of 2003) and about 7,9% (in end of 1993) in Dalarna.	
Total turnover of the industry	Not available at detailed level	
Proportional share of the area in the national production within the chosen branches	Not available at detailed level	
Recent trends within the chosen industry branches (scale)	Not available at detailed level	
Markets, where are products primarily sold?	Not available at detailed level	
Presence and official role of the following in innovation facilitation in the chosen branches	Presence	Official role
	Weak/moderate/strong	Weak/moderate/strong
Universities or other education institutes	Moderate	Moderate
Government or private non-profit research institutes	Moderate	Moderate
Commercial laboratories /R&D enterprises	Moderate	Moderate
Public regulatory authorities	Strong	Strong
Development agencies and business consultants/experts	Moderate	Moderate
Industry associations and/or professional networks	Strong	Strong
Interest groups and/or public sphere movements	Strong	Strong
Financial institutions/actors	Moderate	Moderate

Appendix B: Short stories of good practice

Through the ISP project process, a number of examples of "good practice" have been identified. The following "short stories" include examples of how innovation has successfully taken place and/or has been facilitated in the selected study regions.

Example of good practice from Denmark

Theme: Innovation activity

Topic: The Thise Dairy

Further information: www.thise.dk

Key description: Thise is a local village dairy working as a successful product development company with innovation of organic products as the only constant.

The operation: A group of organic farmers and a young dairy manager established Thise dairy in 1988. The manager took over the business from his parents. He is just as local as the dairy. He and his knowledge on product and process development was the driving force behind the establishment of the organic dairy. The farmers delivering to Thise have since then been very loyal towards the dairy and its production concept. Today the name Thise is recognized by 47% of all consumers (enquiry made in 2002), it has 60 employees and an increasing turn over of 120 million DKK. Locally the success of the dairy has had a very positive influence, the Thise village e.g. became the Danish village of the year in 1998 and is all in all a very living village with a large self-assurance. Nationally the manager is very active in very different kinds of political, scientific and administrative boards and councils. That is, Thise is well oriented on new support programmes and the like e.g. on innovation and they do not hesitate to apply for them/make use of them and this with great success.

Innovative elements: Three examples of Thise's development of new organic products:

"Jersey 0,5%". The milk is made of non-homogenized milk from jersey cows and has a more full-bodied taste than typical low-fat milk. The milk was launched in 2001(three weeks before Arla launched their 'mini-milk') through Irma and became a big success that could now be bought in many other supermarkets as well. The concept of making low-fat milks has been followed by two other products: a 0,7% and a 0,05%.

"Natura semi-skimmed milk" was launched as a regional product in May 2004. The milk is guaranteed to originate from four named farmers in Lemvig municipality (the farmers and their farms are presented on the homepage). In the marketing of the milk the dairy liked to tell the story of the milk being just as local as wines carrying the label: Appellation origin controllé. Again Irma played a major role in the marketing process.

"Bjørnsholm Gårdmælk". Inspired by the regional product "Natura semi-skimmed milk" and pushed by Arlas announcement of their wish to launch a not-standardized milk Thise started producing a not-standardized milk from one farm (Bjørnsholm) in July 2004 (again some weeks before Arla). This time the product is marketed as a 'chateau-bottling'. With it Thise distanced their not-standardized milk far above the milk that Arla is capable to produce. The milk was launched in Irma.

Impact: Thise has created its own niche for special organic quality products, which has filled out the holes that Arla Foods leaves behind when delivering organic milk and cheeses for the masses. Especially the idea introduced in 1992-1993 of dividing the milk after breed of cattle has shown to be very fruitful in the niche strategy of Thise. Thise products have become one of the strategic products for a shorter quality supermarket chain (Irma) in the eastern part of Denmark. The relation between this supermarket chain and Thise has been decisive for the survival of the dairy.

Example of good practice from Finland

Theme: Innovation activity

Topic: New products of a food industry firm

Further information: www.jukkolanjuustola.fi

Jukkolan Juustola Oy is a family enterprise with approximately ten employees, entrepreneurs included. The firm produces and markets cheeses, of which the most well-known is leipäjuusto, a Finnish specialty. The market area for the firm is the whole country. Cooperation with different partners, for example with wholesale and retail groups and feedback from customers, are important for the firm. The firm has implemented many renewals partly connected to each other in the past two years.

The firm has made a big investment in packing machinery, which has enabled producing new products. The investment has proved to be a successful decision.

The leipäjuusto –product has been renewed. Jukkolan Juustola Oy is the only one in Finland producing different sizes of leipäjuusto, for example four-leaf leipäjuusto with four round ready portions of cheese. The new products with their appearance and personality have raised national interest.

The firms has introduced to market cheese boxes with one to four different quality cheeses in rather small pieces. Cheese boxes are a national novelty. The idea for the new product was market oriented. The entrepreneurs saw a market niche for smaller consumer packages. The idea was elaborated and studied in cooperation with the firm's big clients (wholesale and retail groups).

In the cheese boxes there are also Central European quality cheeses, which the firm started to import related to the new product. Imported cheeses are bought from regular suppliers and for the part of these cheeses the firm is cooperating also with an expert from Central Europe.

The new products have brought new markets and more big customers for the firm. Products are being developed further in cooperation with customers.

Example of good practice from Iceland

Theme: Innovation activity

Topic: Innovations and renewal processes at Keldudalur farm

Further information: Þórarinn Leifsson and Guðrún Lárusdóttir (contact persons), http://www.keldudalur.is, keldudalur@keldudalur.is,

Key description: Keldudalur farm is an example of an Icelandic farm that has be exceptionally active in implementing various novelties in the past few years. These include extensive changes of production methods, e.g. application of new technologies for milking and livestock feeding as well as application and development of new methods for cultivation and handling of barley and other field crops.

The operation: Keldudalur is a mixed farm, located in Skagafjörður district in the Northwest region of Iceland. The livestock includes cows, sheep and horses although the emphasis is on milk production. The Keldudalur operation has also recently got involved in tourism, offering accommodation on the farm. Keldudalur is a family farm, where three generations have a role in the farming activities. The main responsibility of the farm is, however, in the hands of Þórarinn and Guðrún, who have operated the farm since 1996 when they took over from Þórarinn's parents. Both Þórarinn and Guðrún possess a B.Sc. degree from Hvanneyri Agricultural University. The annual turnover of the farm is approximately 22 millions ISK (262.000 Euros), and the annual labour need is approximately 3 man-years. The milk production accounts for approximately 80% of the annual turnover. There are 50 dairy cows on the farm and the annual production rights of the farm are 215.000 liters. The milk that is produced in Keldudalur is processed by dairy plant in a neighbouring town (Sauðárkrókur), which is operated by the local cooperative.

Innovative elements: In the last few years various novelties have been implemented on Keldudalur farm, concerning pretty much every aspect of the operation. Extensive restoration has been made on the existing cow barn, new annexes added, and new computerized equipment installed both for milking and feeding. The renovation process in Keldudalur has been used as a source of ideas for farmers all over Iceland who have gone through similar processes more recently. Þórarinn and Guðrún have also been pioneers in the cultivation and handling of barley for animal feeding. In cooperation with Hvanneyri Agricultural College they have developed methods to store barley, which can be considered a novelty in the national context. Utilization of home-grown barley in Keldudalur has decreased the reliance on imported grain considerably.

In the same period, Þórarinn and Guðrún have also bought additional production quota. Expansion and innovations have, therefore, gone hand in hand. According to Þórarinn and Guðrún, the main goal of the various innovation projects on the farm is to increase the profitability and efficiency on the farm. The expansion of the operation has produced higher turnovers, although the workload has stayed relatively the same due to the utilization of new technologies and methods. The overall changes allow for increased salaries to be drawn from the operation and have therefore improved the livelihood of the owners.

Example of good practice from Norway

Theme: Innovation activity

Topic: Lofoten Products (Lofotprodukter)

Further information: http://www.lofot-delikatesser.no/

Changing sales concept and visual profile

Lofoten Products was established in 1994 and has become a high quality food producer of Lofoten delicacies. After having re-established the business and several bankruptcies and relocations, the company has now an annual turnover of approximately 53 million NOK. There are 29 people employed at their offices at Leknes, of whom 22 are within production.

The idea behind the company was that someone saw the importance of establishing fish processing activities in a consumer-ready form, thereby adding value to the local fishing industry, which there had been talks about for a long time. It was initiated through co-operation with Lofoten Chefs (Lofotkokkene), a group of high-profile chefs at the local fishery school. With the great benefit of their competence, network and reputation, a long period of product development culminated in an assortment of six delicacy products, all new to the market.

In 2001 the company started a design project. They wanted to build up a brand that reflected values and quality of their products and the region where they came from and to stand out from the rest of producers in the market. This hopefully would make it possible for them to take a bigger share of the market For a long time they had used brand names like 'Lofoten Delicacies' and 'Lofoten Chefs' when marketing their products, but in February 2003 they changed their sales concept and visual profile, and made use of the brand 'Lofoten', with new packaging and labels.

The redesign was a result of a long process with several actors. When they started this project they soon realized that developing a new brand would cost too much and demand too many resources for them to realize alone. By coincidence they had heard about a public program, which supported companies that put an effort into design. This was a program administered by Innovation Norway - a public support agency - promoting nationwide industrial development profitable to both the business economy and Norway's national economy, and helps realize the potential of different districts and regions by constructing towards innovation, internationalization and promotion. Innovation Norway supported Lofoten products financially through he governmental fund for industry development within the periphery, who gave a grant of 300-400.000 NOK.

Innovation also put them in contact with the Norwegian Design Council (NDC), which helped them define their needs and put them further in contact with several design companies. Strømme Throndsen design bureau made them a whole new design with the new brand Lofoten. The redesign has been a great success in terms of both increased turnover and sales, which have increased by over 45 percent. They are getting a larger share of the market in the southern parts of Norway. The success has also made them look at markets outside Norway and their sales strategy now includes selling products of high culinary value to the Nordic market.

Although the company mainly produces fish products, they are also distributing agri-food products from Lofoten like, rack of lamb ribs from LofotLam (Norwegian specialty, esp. at Christmas) and cured leg of mutton from LofotLam. For the moment Lofoten Products are not willing to distribute more food products, but they can be one of several possibilities for building up a marketing and sales company for the whole food sector in the region.

Example of good practice from Sweden

Theme: Innovation activity

Topic: Product development in the food processing industry

Further information: www.siljanschark.se, www.pyramidbrod.se, www.leksandsbrod.se.

Key description: Product development targeting new markets (ethnic groups, single households, niche markets etc) building on new production processes combined with traditional brand name.

The operation: Firms in the food processing industry in Dalarna implement product and process innovations as a way to reach new target groups and niche markets. Development of new products (adding new types of taste to bread, changing processing of meat etc.) often requires a new production process and equipment, hence linking product and process innovations. Some examples from food processing in Dalarna are Siljans Chark (www.siljanschark.se), Pyramidbröd (www.pyramidbrod.se), and Leksandsbröd (www.leksandsbrod.se)

Innovative components: Introduction of product and process innovations at the firm level product developments. Some examples of product innovations are focusing on new flavors of bread, pork-free sausages to meet the demand also from ethnic groups, and use of historical crops (Dinkel, Spalt) in response to health trends (Glychemical index etc).

Example of good practice from Denmark

Theme: Knowledge and competences

Topic: Design and Innovation in Danish Furniture Manufacturing

Further information: www.skivets.dk, www.eamv.dk, www.moebelcenter.dk

Key description: Innovation-based knowledge and competence building in the Salling furniture industry; focusing on new and revised education programs and company competitions on design.

The operation: The Salling area furniture cluster of manufacturing firms employs more than 1100 people and has an annual turnover of approximately 4 billion DKK, mostly for exports to the European market. Educational projects are carried out in a co-operation between local furniture manufacturers and a number of local and national education and governmental institutions, including Skive Technical School/Business Academy Mid-West (www.skivets.dk, www.eamv.dk), Development Centre for Furniture and Wood (www.moebelcenter.dk), Manufacturing firms, Wood Manufacturers Employers Union. Project resources and external support from Viborg County, Ministry of Business and Housing, Technological Institute, Aarhus School of Architecture and Design, Private technical and business consultants.

Innovative element: The education projects are all new initiatives with the aim of enhancing innovation and the knowledge base in the sector in the region.

Examples of new educational initiatives:

"Innovator" – a 2-year study with specializations in design/product development, trend/marketing, process/logistics, offered to students at high-school level of education.

"Innovation-designer" – a 1½-year course with modules in the idea phase, the constructions phase and the pre-production phase of innovation, offered to employees in the furniture industry with some years of experience.

"Furniture Cup" – an annual competition among furniture manufacturers on new furniture and product innovation with integrated innovation education programme for participant teams. For manufacturing firms that take part and/or sponsor a consortia of developers.

Impact: The innovation-based educational initiatives in the furniture industry in Salling are expected to improve the competitiveness of the industry.

Example of good practice from Finland

Theme: Knowledge and competences

Topic: Proactive policy of the local actors in Oulu South. The integration to the national centre of expertise programme

Further information: http://www.rfmpolis.fi/ http://www.nivala.fi/teollisuuskyla/ http://www.prometal.fi/web/index.php http://www.oske.net/ http://www.oulutech.fi/index.php

The local actors like municipalities, technology centers and local development agencies have reacted proactively to the global threats and opportunities of the electronics industry in Oulu South. **The regional development strategies of the three subregional units aim among other things to improve the production conditions of the industry by enhancing the knowledge base of the firms and by upgrading the competences of the staffs**. Networking and development of an applied research environment have been the main courses of action.

The efforts have lead to the establishment of the university unit Oulu South Institute in 2001, as well as to a participation in the newest round of the national programme of the Centre of Expertise Programme in 2002. The national Centre of Expertise Programme was launched in 1994 and extended in 1998 and 2002. Altogether 22 centers have been appointed for the period of 2003–2006. Four centers are on networked basis. The mission of these centers is to utilize international high-level knowledge and competence, improve development resources of the regions, and create new employment opportunities. The national programme supports regional specialization and cooperation between different Centers.

The Oulu South belongs to two different networked centers of expertise: Metal industry of the Bothnian Arc i.e. **Prometal** and Multipolis network. The core of ProMetal is made up of the **production studios** of Tornio, Raahe and Nivala (a municipality in Oulu South) and the background organizations (firms and University of Oulu). **Nivala production studio** is run by the local technology centre. It specializes in electronic mechanics serving the contract manufacturers and sub-contractors, providing a research and product development environment through the expertise of universities and polytechnics and acting as a regional marketing data centre for the electronic mechanics industry. The network Prometal offers laboratory, incubator service and other resources to the production studio. The production studio is funded by Structural Funds, as part of the Objective 1 programme Northern Finland.

Oulu South is also part of **Multipolis** network, which connects 15 specialized spatial clusters (polis) of technology enterprises and expertise in northern Finland. Its goal is to expand the technology related expertise and knowledge from the Oulu urban region to other areas in the north. The concrete aim is to improve competitiveness and knowledge-base of technology enterprises in northern Finland. **RFM-polis** is located in Oulu South and it is managed by Ylivieska technology centre. It specializes in wireless telecommunication technology (RF-technology) and digital media. Its main field is the wireless applications in the industry. The aim is to initiate research and development with the universities and polytechnic and to support the firms and promote entrepreneurship for example through the incubator project.

Both Nivala production studio and RFM-polis

- are specialized in narrow technological branches which support the industry,
- are implementing the regional high school strategy,
- are working together with different emphasis,
- aim to improve the knowledge base of firms by overregional networking,
- are utilizing the resources gathered in the bigger networks of the centers of expertise,
- have initiatives to use the applied research in order to develop the industry for the long term,
- aim to build ICT related production environment in the region,
- have got financial support from Structural Funds and
- are run by technology centers owned to a large degree by local municipalities.

Example of good practice from Iceland

Theme: Knowledge and competences

Topic: Hestasport ehf. - importer of knowledge for product development in adventure tourism

Further information: Magnús Sigmundsson (contact person), tel. 453-8383, see also http://www.riding.is, http://www.rafting.is

Key description: Hestasport ehf. is a mature firm in the field of adventure tourism, which has been active in product innovation and has developed unique competences for a particular type of services, i.e. whitewater rafting tours. To achieve this, the firm has successfully utilized fairly inaccessible knowledge and competences from abroad.

The operation: Hestasport ehf. is operated in Skagafjördur district in the Northwest region of Iceland. Hestasport is one of the oldest adventure tourism firms in Iceland with over 30 years experience as a riding tour operator. In addition to various activities associated with the Icelandic horse, the firm also started to offer river rafting tours in 1992, which at that time could be considered quite a novelty on the Icelandic market. Currently the firm offers a range of different riding and river rafting tours, as well as accommodation in country cottages. Package deals are offered, which include a pick-up service at the international airport (around four hours drive from Skagafjörður district), accommodation, meals, and selected or assorted adventure trips (activities á la carte). The firm employs around 20 people over the summertime (approx. 6 man-years on an annual basis). Hestasport's customer group consist of a mix of Icelanders and foreign visitors, with foreign visitors dominating the group of riding tour buyers, while Icelandic buyers account for around 60-70% of the river rafting customers.

Innovative elements: In the last decade or so Hestasport has been successful in developing the sport of whitewater rafting as a tourism product. The firm has been a pioneer in this field of adventure tourism in Iceland. When the firm started to offer river-rafting tours, knowledge and experience of the sport and the necessary competences to develop it as a tourism product were very scarce within the country. However, to be able to successfully offer this new product the firm needed skilled staff, i.e. professional guides with experience of difficult rapids and knowledge on the necessary safety measures. In other words to be able to successfully introduce this new innovative product to the market, the firm needed new knowledge and skills, which were neither possessed by the firm nor easily accessible at that time. The firm's initial approach to this challenge was to send one staff person abroad for training as well as hiring another, which had received training abroad, more precisely in Nepal. However, this did not turn out to be sufficient, since the demand for the rafting tours grew fairly fast. By utilizing the firms' contacts, additional skilled guides were hired from abroad. In the past few years, Hestasport has employed certified guides from various countries, including Nepal, New Zealand, Australia, Canada, Austria, and France. These employees have brought in important knowledge and competences, which have been absorbed by the firm's other staff and has widened the firm's networks in the international context. Now the firm's owner is considering setting up a training program for river rafting guides, and by that broadening the scope of the firm as well as extending the business season. Hestasport has worked closely with the state authorities in developing the necessary regulatory frameworks and safety guidelines for the sport of whitewater rafting in Iceland.

Example of good practice from Norway

Theme: Knowledge and competences

Topic: The White book on tourism development

Further information: http://www.mimir.no/rapporter.asp?id=47, http://www.lofotradet.no/prosjekter.htm

The White book and related Master plan process in branding of Lofoten as tourism product

The tourism industry case in Lofoten offers an example of an establishment of a knowledge and competence base that feeds right into industrial innovation of the sector. The so-called White book on tourism development is a collaborative product with main contribution from one of the Nestors in Norwegian tourism consulting and with the Norwegian Innovation Policy agency "Innovation Norway" as project leader and financing actor.

The White book is very close to what could be called a National manual for destination development. It combines empirical experience from destination development with theoretical insights and practical competence about operating destination development as a social process.

For Norwegian (and other) destinations this codified White book is probably not possible to exploit fully without the competence to run the process in practical terms. In Lofoten the same tourism consultant is engaged in the project leadership. He has extensive experience from destination development across Norway. The project aims at a profiled branding of the destination but with corresponding concrete innovation implementation at the industry and firm level. The process, which has got the name Master plan, depends on a broad mandate in the community and a steering committee with innovation policy influence and political, regulatory and preferably financial power. The main idea is to gather stakeholders that are interested and motivated enough to own the process of development. Early stages of the process includes gathering of knowledge and consensus about the aim and objectives.

Later stages involve policy implementation at the level of different stakeholders, i.e. with concrete policy implementation tasks for municipalities, supporting agents, facilitating actors, as well as for the firm level of tourism suppliers and their suppliers.

Example of good practice from Sweden

Theme: Knowledge and competences

Topic: Labour supply and key competence in light-scale manufacturing

Further information: www.teknikdalen.se

Key description: Project recruitment pilot (Rekryteringslots) targeting a comprehensive approach to facilitating the access to key competence and labour recruitment run by the Technology park of Dalarna: Technology Valley (Teknikdalen).

The operation: The project 'Rekryteringslots' run by Teknikdalen is targeting facilitation of recruitment process also taking into account the needs of the occupation possibilities for spouse, which have been identified as limiting factors in for people moving to Dalarna. Teknikdalen is a foundation established by two of Dalarna's large steel corporations in cooperation with municipalities, SMEs and other actors.

Innovative components: The project takes a comprehensive regional approach to address a limiting factor in fulfilling demands for key competence and labour supply in Dalarna.

Example of good practice from Denmark

Theme: Cooperation and networks

Topic: Cross-Sectoral Approach to Tourism

Further information: www.vifu.net, www.kultursejlads.dk, www.leadernordvest.dk

Key description: How working with tourism across sectors has created a range of alternative tourism activities in a peripheral area in North Western Jutland.

The operation: The area in question inhabits a rich natural and cultural heritage; but is in need of improved economic development. A priority is that the natural and cultural assets should be used and developed as valuables on the market; they should be made visible for the tourists and also for the newcomers to the area. The overall goal is to develop an authentic tourism product for the larger rural district, which will attract visitors and also function as an alternative development strategy (new know-how and employment). The following areas of particular tourism development potential have been identified; 1) Arts and Crafts, 2) The Flavors of Western Jutland (Local/Regional Quality Food), 3) Experience the nature, 4) Sailings and life at the harbour and 5) Package solutions

Examples of initiatives developed:

"Network of Small Food producers". Competence building in SMEs, helping each other with product development and marketing. This has resulted in the establishment of a common marketplace for regional quality food producers. The visitors get the possibility to experience the flavors of local products. In a two-year period (2002-2004), the project has received DKK 395.000 in EU support (www.vifu.net).

"Arts and Crafts Network". The mobilization of the areas many arts and craftsmen to cooperate towards common goals instead of acting as individuals, and create new activities, i.e. the establishment of a regional exhibition at the Bovbjerg Lighthouse. Project in pilot phase.

"The Cultural Voyage". Building bridges between the promotion of nature /culture and the tourist industry. During the summer months the schooner SAGA sails fjord safaris and evening cruises on the western Limfjord. The fishing cutters M/S Mindboen and M/S Emma-Line take visitors on trips to explore the Northern Sea departing from the fishing villages Thorsminde and Thyborøn. The tours are based on the active participation of the tourists and there are also activities in the harbour towns, like fishing auctions, fishing days, "Open harbour", guided tours and so on. In a two-year period (2002-2004), the project has received DKK 737.000 in EU support (www.kultursejlads.dk).

Innovative element: A strong partner is the Local Action Group (EU LEADER+) who is responsible for developing the "North West Jutland Network". This construction works with establishing networks within 5 different areas; ICT, regional foods, nature and cultural tourism, human resources and production and service industries). Within the field of developing tourism the following partners are involved: public authorities (the county and local municipalities), cultural institutions (museums/exhibitions), local tourist associations, and a wide range of tourist operators. These networks have since they started in 2003 initiated a remarkable level of activity and regional/local mobilization. Projects (see above) are typically initiated with public finances, and after a period of learning and building knowledge the aim is for them to become financially self-sustainable and with a decentralized coordinative function (www.leadernordvest.dk).

Impact: In North West Jutland a wide range of partners are working together to create "small scale" activities that nonetheless have large-scale impacts. Experiences from a broad spectrum of activities and projects show that it pays off to cooperate and work across sectors when working with developing tourism in a peripheral setting.

Example of good practice from Finland

Theme: Cooperation and networks

Topic: Joint production of services by small tourism industry firms

Further information: www.lestipuu.fi

Lestipuu Oy is a small enterprise in tourism, offering accommodation services and different programme services related to nature. Accommodation facilities are cottages by the lake. The programme services are among other things wilderness guidance, hiking, hunting and fishing.

Networking is an essential part of the operations of Lestipuu Oy. The firm mainly cooperates with three other small enterprises in tourism. Lestipuu Oy rents facilities of a wilderness and camp centre and buys food services from Firm A. Respectively Firm A buys among other things wilderness guidance services from Lestipuu Oy. Firms B and C both offer programme services. Lestipuu Oy, Firm B and Firm C each buy and sell nature related programme services mutually from and to each other. This way all these firms are able to widen their supply of services. The entrepreneurs in this network of four firms know each other well and they ask and give help mutually when needed. With its present resources Lestipuu Oy wouldn't be able to take care of big groups of customers alone. Due to the network arrangements, there is more staff on hand.

The most important renewal for the firm in the past two years has been efforts to develop the winter tourism. Related to this, Lestipuu Oy has introduced a new product, snow shoe safaris. The investment on snow shoes was made together with Firm B and Firm C. All the four partners have been developing the new product. Snow shoe safaris are also connected to winter fishing in cooperation with a local fisherman.

Example of good practice from Iceland

Theme: Cooperation and networks

Topic: Innovation in culture-based tourism, by Grettistak development initiative

Further information: Pétur Jónsson (contact person), tel. +354 8605970, see also http://www.grettistak.is (only in Icelandic) and http://www.northernperiphery.net/main-projects.asp?intent=details&theid=44

Key description: Grettistak is a young organization that aims at building a platform for innovation in tourism within Húnaþing vestra municipality through a cooperative approach.

The operation: Grettistak is an organization, which was formally established in 2002 in Húnaþing vestra municipality in Húnavatnssýsla district in the Northwest region of Iceland. The organization was initiated as a cooperative effort of the municipality, a local tourism association and a local cultural museum. The organization is, therefore, built on a cooperative approach. The organization's mandate is to facilitate cultural and economic growth in Húnaþing municipality by utilizing cultural heritage and history of the area, especially the Icelandic sagas with an emphasis on Grettis saga. The supporting objectives are to make the Húnaþing vestra more visible as a tourism destination, where the areas cultural assets should form the core attraction, as well as building a joint platform, which private firms and individuals in the area can utilize in their development efforts. The organization is lead by a board, which has active interactions with representative of tourism firms and public entities in the area through meetings and consultation. The organization does not have permanent staff, but consultants and other staff are hired for particular tasks. The annual turnover of Grettistak is around 10 millions ISK (approximately 120.000 Euros).

Recent projects that the organization has been involved in are improvements of signing and designated walking tracks, an annual cultural festival, as well as participation in an EU funded development project called Destination Viking. Participation in this international development project is seen as a source of ideas for further development, as well as source of new knowledge for local actors that aim at initiating new projects in the cultural tourism.

Innovative elements: Grettistak is a young organization that was established as a cooperative initiative with the aim to build a platform for innovation in tourism within Húnaþing vestra municipality. So far it is hard to measure any hardcore results from the project but the organization seems to build on a well planned and ambitious approach. The strong emphasis on the cooperative aspect of the organization, both the basic structure and operational methods of the organization as well as strong efforts to developed networks abroad through the Destination Viking project, can also be considered likely to contribute to the innovation potential in the area.

Example of good practice from Norway

Theme: Cooperation and networks

Topic: The coordinator Destination Lofoten

Further information: http://www.lofoten.info/

Destination Lofoten as a main node of cooperation and networks of tourism development

Destination Lofoten is the main tourist industry actor in the region. It acts as a commercial unit selling gadgetry, promotional products and information products, as well as a supporting agent as Lofoten´s joint promotional body. Destination Lofoten has a number of tasks and is responsible for the following:

- International and national marketing, promotion and sales.
- Coordinating existing travel trade products in the area, and product development.
- Co-operating with international tour operators.
- The production of promotional material.
- Representing Lofoten at trade fairs and shows.
- Developing a joint profile and Lofoten as a destination.
- Co-ordinating product information.
- Providing official tourist information
- Taking care of the hospitality- and information duties on behalf of the municipalities of the Lofoten islands.

Destination Lofoten has a uniquely strong mandate in Lofoten, from the industrial level and from the policy level. The majority of industrial firms have membership in Destination Lofoten. All six municipalities and their local tourism offices and committees, support financially and collaborate qualitatively with Destination Lofoten.

Example of good practice from Sweden

Theme: Cooperation and networks

Topic: Cross-sectoral local networks in tourism and food sector

Further information: http://www.siljan.se/, http://www.regiondalarna.se/turism.html, http://www.fulufjallsringen.com/, http://www.hush.se.

Key description: Development of networks and organizations that promote tourist events and activities in the region around lake Siljan in Dalarna. The activities are often linked to traditional food and farm concepts.

The operation: Examples from tourism are found in several organizations such as Siljan Turism, Dalarnas Turistråd, and Fulufjällsringen. Examples in the food sector are found in events like 'Mat runt Siljan' and the work with distribution networks for products from small-scale farm processing by the organization The Rural Economy and Agricultural Societies (Hushållningsällskapet).

Innovative component: These initiatives are linking actors in both food and tourism industry, applying local branding as one strategy for promoting regional development also targeting facilitating conditions for innovation and product development for farmers.

Example of good practice from Denmark

Theme: Innovation conditions

Topic: "Regional Growth Environments"

Further information: www.vifu.net, www.moebelcenter.dk, www.videnskabsministeriet.dk/cgi-bin/theme-list.cgi?theme_id=101931

Key description: The support framework "Regional growth environments" stimulates bridge building between companies and knowledge institutions while building on existing competences and specializations in regions.

The operation: Government support is granted to research and educational institutions working with knowledge and technology dissemination. The funding cannot exceed 60% of the total budget. Support is granted for a three years period with a possibility for a two years extension. The "growth environment" is expected to develop into a self-financed institution.

Two of the specific initiatives in operation in Viborg-Ringkoebing counties are related to the food sector and the furniture sector: 1) The Knowledge Centre for Food development (VIFU), Holstebro, has the purpose of building bridge between knowledge institutions and food producers and processors with the aim of enhancing collaboration and competences within the sector. Themes are: Logistics, sales and production, product development, education, and consumer awareness (www.vifu.net). 2) The Development Centre for Furniture and Wood, Skive, aims at strengthening the collaboration with knowledge and educational institutions and to raise the competences and level of education of the companies in the sector through improved education, courses etc. (www.moebelcenter.dk).

Innovative element: A new support framework for stimulating partnership building between companies, research and educational institutions and knowledge disseminators with regional knowledge and innovation centre projects all-over Denmark in the areas of: fishery, food, suppliers, steel, offshore, transport, aluminium, robot technology, entertainment, finance, seeds, furniture and wood, wind energy, IT, biotechnology, manufacturing, market gardening.

Impact: The "Regional Growth Environment" initiatives have had success with bringing relevant actors from the private sector and public education together and develop specific projects of knowledge and competence-building and innovation within many sectors. The initiative is based on local participation and co-funding, builds on existing specializations, and is active with projects in all regions of Denmark.

Example of good practice from Finland

Theme: Innovation conditions

Topic: The project for development of the small scale food industry

Further information: www.elintarvikkeet.fi

Many of the firms in the case study of the food industry had benefited from a project for developing the small scale food industry. The project is funded by the rural department of the Employment and Economic Development Centre for Ostrobothnia (T&E Centre) and the European Agricultural Guidance and Guarantee Fund. The project is administered by The Federation of Education in Central Ostrobothnia. The area of operation of the project is the region of Central Ostrobothnia. The project started in 2001.

The emphasis of the project is on developing the farm-related food production; on product development, marketing and package design. The goal is also to promote cooperation between primary production and processors so that vegetables and root crops cultivated in the region would also be processed locally and marketed forward as complete products.

One of the most important tasks for the project is to create innovativeness and new products. The aim is to find good practices, which would set an example for other firms. Within the project all the possible help is given to firms in order to bring enterprises and products to market. The work within the project is partly consultancy, and partly concrete work, like making labels. The project offers advice and services in the following matters: product development, designing and making labels, own control, hygiene control, planning and buying equipment, making new contacts, networking, training, information seeking, personnel matters, and paperwork related to different (funding) applications. Expertise and services, such as laboratory services, are bought when needed. The project has also for example accomplished cooperation in logistics between firms in the region.

In practice the project participates for example in the process of developing a new product. The process is usually as follows: 1) an entrepreneur elaborates an idea of a new product or she/he has been asked for a certain product by a customer. 2) the entrepreneur gets into contact with the project leader, with whom the matter is thought out. It is for example evaluated whether it is technically possible to produce the product, whether the firm has sufficient equipment or whether new investments are needed and especially, whether a sensible price can be set for the product. 3) expert services are bought when needed.

There is one person, with a long background in the food industry, working in the project. The project and its leader participate in different regional and national networks of expertise in the food industry and in the field of developing the Finnish food industry (like Food Finland, theme group of the Rural Policy Committee). The project buys services from national (like Agrifood Research Finland) and regional research institutes.

Example of good practice from Iceland

Theme: Innovation conditions

Topic: The northern coastal experience project (NORCE)

Further information: http://www.northernperiphery.net/main-projects.asp?intent=details&theid=66

Key description: The NORCE project is a transnational development project focusing on heritage-based tourism. The project can be regarded as an initiative aiming at improving the conditions for innovation, through the exchange of experiences and ideas between the project partners and the facilitation of local networks, and the development of new products and marketing strategies at the local level.

The operation: NORCE is an ongoing transnational development project receiving its core funding from the Northern Periphery Programme (NPP). NPP is one of thirteen Interreg IIIB programmes aiming at encouraging and supporting transnational co-operation between the regions of Europe. The NORCE project includes 15 partners from Iceland, Greenland, Norway, Faroe Islands, Sweden, Scotland and Newfoundland Canada. The project is lead by the Regional Development Institute of Northwest Iceland (ANVEST).

NORCE's mandate is to establish a network of coastal heritage sites throughout the Northern Periphery region. Through the project, a joint information strategy for these sites will be developed and information for key end-users, such as local tourist organizations, SMEs and transportation providers, will be produced. The strategy will promote and integrate the relevant physical connections with cultural links. The project will also assist individual areas to develop and promote particular aspects of their cultural heritage, so that they can function more effectively as part of the network. The project will further seek to strengthen cultural links between the participating organizations through the transfer of information and the use of exchange visits by project participants.

The project started in May 2004 and is scheduled to be completed in June 2007. The project has a budget of 1.187.500,- Euros for the three years period.

Innovative elements: The NORCE project will promote and enhance the cultural coastal assets of the North Atlantic region through highlighting their shared elements, as well as their individually distinct characters. The project has, therefore, both a strong inward and a strong outward focus. The project emphasizes learning from the experiences and situations of the partners from different countries as well as the development of local networks, which will allow for a dissemination of information on coastal heritage sites in a local context and can be utilized in product development and marketing strategies. Although the project is still early in its duration period it can easily be regarded as an initiative that improves the conditions for innovation, through the facilitation of economic diversification and heritage-based tourism.

Example of good practice from Norway

Theme: Innovation conditions

Topic: Lofilab

Further information: http://www.lofilab.no/

Mainstream national level innovation policy in aquaculture in Norway is locked into a linear innovation strategy, where science driven innovation is expected to lead to the domestication of new marine species. Lofilab has an interactive approach to cod fry production. The Lofilab strategy combines science-based knowledge and a long term experimentalist approach to the practical difficulties encountered in the domestication of cod. This is done through exploiting the natural resources and conditions of Lofoten, which is the natural breeding ground of the Norwegian Arctic Cod. As a result of this Lofilab today has a core position, with a unique competence in cod fry that has a superior quality, as compared to industrially produced fry.

Paradoxically, this strong position in terms of innovation is combined with severe financial difficulties. Also, Lofilab has no strategy of patenting and exploiting its unique knowledge.

Example of good practice from Sweden

Theme: Innovation conditions

Topic: Wood-cluster and innovation in light-scale manufacturing

Further information: www.iucdalarna.se

Key description: Industrial development centre (IUC) was established as an integrated policy on innovative actions creating environments conducive to innovation in promoting wood-cluster and development of new composite wood materials.

The Operation: Dalarna has a long tradition of forestry and forest-based industry. The region is relatively less developed in the wood mechanic and wood processing industry. These industries are too small to perform their own R&D. Hence, the region must improve its ability to consume research results. IUC addresses this by several projects. The project "Knowledge Network Wood" (Kunskapsnätverk-Trä) aims to create synergies between the university colleges and the wood processing firms in the region. The project Wood Fiber Composite (Träfiberkomposit) works with new ways to mix wood and modern environmental friendly thermo plastics. Products based on this technology are increasingly substituting several other plastic products. The purpose of the project is to develop the unique competence in the region and to strengthen the comparative advantage relatively to other countries. The aim is a cluster based on cooperation between the businesses, R&D-centers and the university. The target group consists of plastic industry, wood, automobile, furniture industry, R&D-centers and the university.

Innovative components: One of the projects on development pilots, at University College of Dalarna, aims at stimulating small firms' "everyday innovations", both process and product innovations. The motto reads "From a regional development perspective and an innovation perspective, it is at least as interesting if 100 SMEs take one step forward each, as it is that one large company takes 100 steps forward".