What can the COVID-19 pandemic teach us about resilient Nordic food systems?

Nordic Council of Ministers

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Crisis presents new opportunities

While the COVID-19 pandemic exposes the vulnerabilities of food systems, it also provides an opportunity to build even greater resilience. This think piece investigates the vulnerabilities of the Nordic food system and highlights the importance of developing a systems-based resilience strategy to ensure that the Nordic Region can bounce forward after future shocks.

While the COVID-19 pandemic exposes the vulnerabilities of food systems, it also provides an opportunity to build even greater resilience

Manifesting itself first in the form of a global health crisis, the coronavirus has now impacted all aspects of life, including the food system. The pandemic has revealed significant **vulnerabilities** on global, regional, national and sub-national scales and has posed new questions about the future of food and agriculture. Further, the connection between the food system and the origins of the virus itself has become much clearer. Human encroachment on the habitats of wildlife species has created ideal conditions for new zoonotic diseases to emerge.[1] Threats originating from the food system, however, are not novel. In fact, an estimated 75% of newly emerging infectious diseases are zoonoses that result from a variety of anthropogenic, genetic, ecologic, socioeconomic, and climatic factors.[2]

TAKEAWAY MESSAGES

- The COVID-19 pandemic has shed light on some of the vulnerabilities in Nordic food systems. There are, however, many other areas of vulnerability that have not been directly exposed under the current crisis.
- Understanding the different types of vulnerabilities is an important step in preparing the food system's ability to cope with future events.
- Resilience reflects the capacity of such a system to maintain human well-being in the face of change by buffering shocks, but also through adaptation and even transformation of parts of the system. In other words, resilience is the capacity to deal with change and continue to develop.
- The Nordic Region has strong foundations of resilience. That said, building and maintaining resilience is an ongoing effort.
- Planning for the future will require a comprehensive assessment of the vulnerabilities of Nordic food systems and an understanding of what the magnitude and breadth of impact would be if the vulnerabilities were exposed. A comprehensive assessment of this scale has never been carried out in the history of Nordic co-operation.

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In a globalised food system, it is easy to dismiss our collective ownership of these **negative spill-over effects**. But Nordic food systems are not cut off from the rest of the world. At the same time, we have unique challenges of our own that have been dually amplified in this historical moment of crisis. The region imports 40%[3] of its food, including products that are not possible to produce in the Nordics. On the other hand, the Nordic countries are also major exporters of agricultural and seafood products such as pork from Denmark, fish and fish products from Norway and Iceland, and cereals from Sweden and Finland. Imports and exports, however, vary greatly across sub-regions and food groups.

Crisis in the Nordic food systems, however, is not a distant reality. Just two years ago, extreme weather events were felt from Iceland to Finland. As a result, crop yields were 20–50% lower than normal and financial losses ran into the millions of euros.[4] Threats that once seemed to occur only in other parts of the world suddenly became real and the impacts tangible. **Climate change** was suddenly on our doorstep.

The recession of 2007–2008 – another example of a global crisis in recent memory – uncovered not only the risks and problems associated with unregulated financial markets but also the vulnerabilities created by **globalisation**.[5] The crisis demonstrated the degree of mutual interdependence in the world economy and how shocks propagated in one place can have a direct effect on the rest of the world. No country, not even the smallest or wealthiest, could come out untouched.

The years 2007 and 2008 will also be remembered as the world **food price crisis**. World food prices increased dramatically in 2007 and the first and second quarters of 2008. Although the Nordic countries were hit less severely than the countries in the Global South, food price inflation surged around the world.[6] This “silent tsunami” hit society’s most vulnerable groups in some parts of the Nordic Region and food banks experienced increased demand.[7]

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The past decade has also been marked by significant leaps in our scientific understanding of food systems and the interconnection between **human and planetary health.** In 2014, the landmark paper "Global diets link environmental sustainability and human health" was published in *Nature*, a top-ranking international science journal. This study clearly links food systems and planetary health. The food-people-planet connection has been further strengthened through other Lancet Commission reports – its reports on human and planetary health in 2015 and in 2019, "The Global Syndemic of Obesity, Undernutrition, and Climate Change" and "Food in the Anthropocene: the EAT–Lancet Commission on Healthy Diets from Sustainable Food Systems". These reports represent thorough reviews of state-of-the-art knowledge, drawing on the expertise of dozens of internationally recognised scientists. Concern over drought, price volatility, and the role of diet in supporting human and planetary health has started to put food-systems thinking higher on the Nordic agenda.

> **Just as the 1918 influenza pandemic gave rise to the modernisation of healthcare systems, so too will the COVID-19 pandemic change the way we grow, distribute, sell, regulate, and consume food**

FOUNDATIONS OF RESILIENCE IN THE NORDIC REGION

Resilience is the capacity to adapt and rebound when food systems encounter shocks and vulnerabilities are exposed. Maintaining and respecting the interconnectedness of humans and our natural environments is the essence of resilience. The Nordic Region has foundations of resilience due, for example, to:

- a long-term perspective of sustainability, and prioritisation of sustainability for current and future generations. This can be seen, for example, in the Nordic Council of Minister's vision to become the most sustainable region in the world by 2030
- relatively low levels of poverty and social inequality
- a long history of co-operation and collaboration across the region, across sectors, and across segments of the population
- a culture of innovation which enables evolution and adaptation
- a well-functioning public sector that is able to act quickly with the trust of the public

Harnessing and maintaining such strengths as those listed above will help us to continue addressing future vulnerabilities and continue to build our resilience.

In current times, the Nordic countries have experienced the COVID-19 pandemic in both similar and different ways. For example, each country has felt the impact of **labour shortages** in the agricultural sector due to a reliance on foreign labourers for many activities, such as berry picking, food processing or veterinary services. To soften the blow, all of the Nordic countries have offered a form of temporary wage support to businesses, such as food businesses, as well as temporary measures to prevent bankruptcy and unemployment. On the other hand, certain components of food systems have been hit disproportionally – from minimal changes in retail to monumental changes in food service.

While the outlook may often seem bleak, history has shown us that a crisis can provide new opportunities to recognise what is not working in our food system and provide the context needed to build **new systems, collaborations, and resilience**. Just as the 1918 influenza pandemic gave rise to the modernisation of healthcare systems, so too will the COVID-19 pandemic change the way we grow, distribute, sell, regulate, and consume food.

The purpose of this think piece is to stimulate a discussion around the vulnerabilities of the Nordic food system and to highlight the importance of developing a systems-based resilience strategy to ensure that the Nordic Region can bounce forward after future shocks. To do this, we use the context of the COVID-19 pandemic as an example in order to focus the analysis. This think piece also reflects on the work ahead and what needs to be done to fully assess the state of Nordic food systems.

Vulnerabilities of current Nordic food systems

Despite being one of the most stable and high-income regions of the world, Nordic food systems are not free from vulnerability. Moving from vulnerability to resilience can help buffer food systems from future shocks.

Vulnerability is the state of being susceptible to harm from exposure to some stressor.[8]

A vulnerable system – such as a vulnerable food system – is one that has lost its ability to adapt to change. Vulnerabilities can be found across a system, and include:

- **social vulnerabilities** such as the reduced capacity of low-income families and individuals to feed themselves in the face of food price spikes;
- **structural vulnerabilities** such as "just in time" food retailing (keeping inventories low by ordering stock on a daily basis to balance supply and demand by using "knife-edge" accuracy[9]) giving rise to an inability to cope with sudden increases in demand;
- **political vulnerabilities** such as a political system with low levels of trust or high levels of corruption that risk an inability to deal with social unrest; and
- **environmental or ecological vulnerabilities** such as depleting soil nutrients to an extent that they are no longer able to generate the conditions for growing food.

Understanding the different types of vulnerabilities is an important step in preparing the food system's ability to cope with future events. This makes it imperative to take a **systems-based approach** to identifying and assessing vulnerabilities, to avoid unexpected challenges and to account for the multiple stressors (drivers) and far-reaching impacts of an exposed vulnerability.

While there has been previous research into several vulnerabilities of Nordic food systems (e.g. (lack of) crisis preparedness in Swedish agriculture,[10] vulnerabilities of Finnish food systems[11]), there are knowledge gaps when it comes to formulating a more comprehensive understanding of 1) the most significant vulnerabilities of Nordic food systems; 2) the interconnected drivers of these vulnerabilities; and 3) the impacts that an exposed vulnerability can have across the food system and across sectors.

The table below provides a starting point for exploring Nordic food system vulnerabilities. The table is based on the Moragues-Faus et al. 2017 classification of vulnerabilities of European food systems, amended to include insights from other existing literature and unpublished work from the Nordic Region. The table provides a non-exhaustive list yet aims to illustrate the breadth of vulnerabilities that have been brought into focus during the COVID-19 pandemic. It is also important to note the other limitations of such a table. In complex systems, such as food systems, challenges are not always linear, and analysis of feedback loops can help us better understand vulnerabilities within those feedback loops. For example, emerging infectious diseases, as well as the consequences of emerging infectious diseases, create vulnerabilities in food systems.

The vulnerabilities highlighted in the table are both local and global in nature. As the COVID-19 pandemic demonstrates, food systems around the world are interconnected and we must acknowledge that resilient Nordic food systems should contribute to building a more resilient global food system.

Table 1: Examples of vulnerabilities of Nordic food systems brought into focus during the COVID-19 pandemic

While not a comprehensive review, the examples listed in this table have been highlighted to provide a starting point for understanding some of the vulnerabilities of our current food systems – especially those exposed by the COVID-19 pandemic. An extensive and systematic map of vulnerabilities, along with a map of existing research and ongoing initiatives, would help identify which vulnerabilities are currently going unaddressed.

Environmental and agricultural vulnerabilities	**Description**	**Potential impact**
Emerging infectious diseases and their links to modern agriculture[12]	• Expansion and intensification of animal agriculture increase risk of animal disease due to crowded living spaces, limited airspace, and animal stress[13] • Industrialisation of animal production increases animal-human contact • Modern agriculture typically uses high levels of agricultural antibiotics[14] – while low levels are used in the Nordics, the same does not always apply to the Nordics' trade partners	• Greater risk of emerging zoonotic diseases • Rise of antibiotic-resistant bacteria in humans → significant risk of MRSA in humans, which can cause death (MRSA is a group of bacteria resistant to many typical antibiotics)
Policy and governance vulnerabilities	**Description**	**Potential impact**
Disproportionate preoccupation with food safety over other food system threats	• The Nordics and the EU have strong food safety measures, but an imbalance in the prioritisation of food safety in relation to the human and planetary health impacts associated with food systems can draw attention away from other pressing issues[15]	• Under-preparedness for other food system threats related to consumption, such as unhealthy diets (discussed below)
Current subsidy systems	• Expressed concern among Nordic food system stakeholders that subsidies promoted, for example, monocropping, livestock production, etc.[16]	• Subsidies can act as a "lock-in" that encourages environmentally unfriendly production or production methods
Lack of policy coherence	• Food system vulnerabilities are often caused by combinations of stressors, yet our current institutions have been constructed to deal with separate parts of the system (e.g. health, agriculture, finance, environment, etc.). As a result, policies, more often than not, reflect these silos[17] • Exposed vulnerabilities often produce impacts that span food systems and sectors	• Without a systems-based approach, it would be difficult to tackle the interconnected stressors leading to vulnerability

Socio-economic vulnerabilities	Description	Potential impact
Diets not aligned with dietary guidelines	• In the Nordics, diets contain a high proportion of animal-source foods, sugar, and saturated fat and do not contain enough wholegrains, vegetables, legumes, or nuts[18]	• Rise in non-communicable diseases, making people less resilient and less able to fight viruses • Unhealthy diets are a leading risk factor for poor health across the Nordics as well as the rest of the world
Changing consumption patterns	• Globally, there is an increasing demand for animal protein.[19] Livestock production is also increasing • In the Nordic Region, plant-based diets are gaining traction amongst certain demographic groups such as young people. However, consumers are demanding foods that Nordic farmers have not traditionally produced	• Increasing Nordic animal production to help meet global demand can come at an environmental cost, including a significant contribution to greenhouse gas emissions and biodiversity loss • Increase in drug-resistant zoonotic bacteria
Obesity and overweight	• In the Nordics, nearly half of adults and one in seven children are above their recommended weight[30]	• Diseases caused by either lack of access to food or consumption of unhealthy, high calorie diets are now the single largest cause of global ill health and a leading cause of poor health in the Nordic Region • Overweight and obesity also increase vulnerability to other risks. Early data suggests that people with obesity are at a higher risk of suffering severe symptoms of COVID-19[20]
Urbanisation	• By 2050, two-thirds of the world's population will be urban dwellers[21]	• Expanding cities (through outward expansion, not increased density) could compete for land needed for agriculture and further encroach on natural ecosystems
Reliance on imports of foods and agricultural inputs	• Self-sufficiency is a policy priority for most Nordic governments yet the Nordics import roughly 40% of the food consumed across the region (varies by country and food group), with some healthy foods such as vegetables, fruits, and nuts being almost entirely imported[22] • Conventional agriculture is dependent on a continuous supply of inputs, many of which are imported[23] • There is no "right" balance between taking part in global supply chains and local food production, and the benefits and trade-offs of both will continue to be an issue of heightened debate • Even during the Covid-19 pandemic, the EU common market and the global food market have allowed global food trade, thus showing that the dependency is not necessarily causing resilience problems for rich countries such as the Nordics	• Breakdowns in long supply chains threaten Nordic food supply • Extreme weather events in countries we import foods from could threaten Nordic food supply • Decreased supply of inputs could make production unviable for some farmers

Lack of crisis preparedness and storage for food	• Crisis preparedness extends beyond food security to also ensuring that, e.g. farms can operate in the face of natural disasters or crop failures. This includes not only food but also agricultural inputs such as fertiliser, veterinary medicines, seeds, etc. • This is linked to state policy on food security, self-sufficiency, and preparedness, which differs between the Nordic countries. For example, Sweden decided in the mid 1990s to stop storing food and inputs for agriculture in case of emergency, partly because of the international security situation at the time.[24] Finland, on the other hand, has continued its mandatory emergency preparedness to ensure the availability of food[25] • In the food sector, more cost-efficient distribution has led to a faster turnover of storage goods[26] • In 2009, only about 10% of private households in Sweden have emergency food storage and single households and families with kids in big cities were identified as particularly vulnerable.[27] Since then, major information campaigns have targeted households' crisis preparedness[28]	• As illustrated under "consequences of climate change", farms can suffer from crisis due to limited power, transport ability, or communication channels • Food storage (both public and private) is small or non-existing, and food supply relies on constant deliveries and imports
Increasing distance between consumers and producers	• Increasingly, high-income countries are relying on the agricultural commodities produced in other regions of the world. Long food chains form a complex web of interactions involving farmers, agricultural inputs, processing plants, shipping, retailers, and more.[29] COVID-19 has struck at the core of global value-chain hub regions such as the EU	• Producing regions bear the environmental cost of production, including land degradation and biodiversity loss[30] • Low transparency in global food chains hide "outsourced impacts" from the final consumer of a food[31] • For long food chains – which depend on complex flows of people, production inputs, and foodstuffs – travel restrictions are likely to prevent the arrival of seasonal labourers who cross borders each year to work on farms[32]
A vulnerable agricultural and food service workforce	• Many agricultural workers in the Nordics are seasonal or migrant workers. For example, over 30,000 foreign seasonal workers are employed in the Norwegian agricultural sector[33] • Temporary workers make up more than 10% of the workforce in Denmark (11.1%), Sweden (15.6%), and Finland (16.2%)[34]	• Hiring of farmworkers may be difficult if they cannot move cross-border, as we have seen with COVID-19[35] • Lower living standards and pay can negatively impact the health of those who we now recognise as "essential" food service workers in times of crisis

Towards greater food system resilience

Building and maintaining resilience is an ongoing process. This is especially the case in a dynamic and rapidly changing world. The aftershocks and knock-on effects of the COVID-19 pandemic – such as global economic recession – are expected to continue well into the future. As such, we must learn from the lessons of the past to build a more resilient future for the Nordic food system. *But what will it take*?

Building and maintaining resilience is an ongoing process

Resilience thinking views societies and the ecosystems that they are dependent on as interconnected social-ecological systems. Food systems – all processes and infrastructure involved in feeding society – are a clear example where social, economic, and environmental aspects are truly intertwined. Resilience reflects the capacity of such a system to maintain human well-being in the face of change by buffering shocks, but also through **adaptation** and even **transformation** of parts of the system. In other words, resilience is the capacity to deal with change and continue to develop.

But what approaches could strengthen resilience? A synthesis of evidence from resilience research from different contexts of natural resource management across the world has identified seven principles that are important for building resilience.[36] Just as every food system is distinct, the way in which (and degree to which) these principles are applied should be uniquely tailored and contextualised. Practically, these seven principles can be used to assess strengths and weaknesses of development proposals, strategies, processes, and operations in an organisation from a resilience perspective,[37] and they can also be incorporated in food policies at different levels. The table below provides examples of how these principles could be applied in the context of Nordic food systems.

To reach the **UN Sustainable Development Goals** (SDGs) as well as other national and regional goals, a transformation of current food systems is needed. But how do we enable transformations in a way that does not make food systems more vulnerable or create severe negative side effects? By simultaneously maintaining or building resilience, through the practice of these seven principles for example, we can transform in a way that still keeps our options open for a changing and unpredictable future.[38] In the long run, this will significantly improve our chances to meet the SDGs.

Table 2: Seven principles that are important in building and strengthening resilience

Principle	Description of the principle from resilience theory	Examples of potential applications in the Nordic food system
1. Maintain diversity and redundancy	Diversity in the components of a system, such as species, stakeholders or sources of knowledge, provides options for the future. Combined with redundancy, or overlap, in important functions, diversity allows components to compensate for the loss or failure of others	• Different kinds of multi-cropping systems and polycultures, such as forest gardening, agroforestry, etc. • Traditional crop varieties are a source of genetic diversity. Some traditional grain varieties proved to be more tolerant in the face of the 2018 drought, for example[39]
2. Manage connectivity	Connectivity can be both good and bad. In a highly connected system, disturbances can spread faster, but connections can also facilitate recovery after a disturbance. The key is to be neither isolated from the outside world nor completely dependent on it	• A higher degree of local-regional self-sufficiency, combined with access to global markets, could provide preparedness for both distant and local shocks, e.g. disruptions in transport networks, as well as local crop failures
3. Manage slow changes and feedback	A slow and gradual change in, e.g., social trust, soil fertility, or environmental pollution might go under the radar but cause abrupt and irreversible damage if a so-called "tipping point" is reached. Understanding important feedback in a system helps to assess the effect of actions, since they can either reinforce or dampen change	• Environmental monitoring and understanding, e.g. of the state of the Baltic Sea or levels of soil carbon and compaction in agricultural fields • Transparency, certifications, and traceability in food supply chains that help consumers assess the impact of consumer choices
4. Foster complexity and systems thinking	Often we are trained to focus on the shorter-term interest of our respective sector or organisation and disregard future uncertainties. Building resilience means adopting an approach that acknowledges the inherent unpredictability of the systems we are working in and the interconnectedness of sustainability issues	• Fostering a systems perspective regarding food in governing bodies and in research, e.g. through funding for inter- and transdisciplinary research on sustainable food systems • Developing cross-portfolio ministerial working groups on food systems • Adopting a "food in all policies" approach, similar to the better known "health in all policies" approach
5. Encourage learning	Through learning, experimentation, and innovation we can adapt to new circumstances. This can be enhanced by drawing on different kinds of knowledge, learning from previous crises, and incorporating processes of continuous learning into our governance organisations	• Systems for monitoring, evaluation, and learning in organisations, and a culture of learning – where there is space to reflect and learn, from both successes and mistakes • Promoting different kinds of "food labs" as spaces for experimentation
6. Broaden participation	Broad and well-functioning participation has the potential to build trust and a shared understanding, which is fundamental for collaboration and collective action. It can also highlight important perspectives that might otherwise be overlooked	• Broad participation in and ownership of the development and implementation of food policies can enhance learning, make policies more robust, and support action and implementation across a multitude of food system actors
7. Promote polycentric governance	When several governing bodies on different levels work together, this provides an ability to co-ordinate actions in the face of change, and flexibility to deal with issues on the appropriate level	• Central government delegating power to local governments or districts to implement policies in a way that is adapted to their local context • Local and national governments collaborating in climate mitigation strategies • Local "bridging organisations", such as Biosphere offices (UNESCO's Man and the Biosphere programme) or Leader organisations (EU rural development program), linking actors from local to national and international levels and enabling collaborations across the public and private sectors and civil society in a specific place

Building back better

The reflex to bounce back to the old ways of doing things can be hard to ignore when there is a sense of urgency to bring back business as usual. On the other hand, the heightened awareness and exposure of vulnerabilities, as well as appreciation for agriculture, food, and fisheries as essential sectors, provides an opportunity to build resilient systems.

Crisis can accelerate trends and turbocharge transformational actions, behaviour, and policies. It can also enable us to experiment and try out new ideas that once appeared too radical or too far from the status quo. There are many initial signals of change in how Nordic food systems have adapted in the recent weeks and months. For example:

- Farm workers have been deemed as providing "critical functions" in society
- Small-scale food producers who usually sell their products to restaurants, canteens, and specialty shops are selling directly to consumers via supermarket websites[40]
- Labour shortages force farmers to call out for local labour in the wake of the crisis. Labourers include people who have lost their jobs in the tourism and restaurant industries, many of whom have never set foot on a farmer's field before[41]
- Government ministries and agencies quickly co-ordinate amongst themselves to address emerging food system-related concerns posed by the pandemic

There is also another trend that cannot go unnoticed. Internal and external shocks to the Nordic food systems now mean that new business models have emerged and many of them will move away from just bricks and mortar infrastructure and assert a larger presence online. Governmental food authorities will need to adapt to this rapid transformation as new opportunities and challenges arise, for example from changing business functions, international trade, and consumer habits.

All around us, there are signals that demonstrate how the food system has reacted to lockdown situations, disruptions in supply chains, new (and emergency) regulations, and changes in consumer be-

> **Prioritising resilience is the best way to buffer the Nordic food system from the future shocks that will inevitably come**

haviour. Many of these trends are also hard to track as we lack hard data to understand them in full. The rapidly unfolding COVID-19 crisis makes the exercise of understanding short-term change exceptionally challenging. Furthermore, adaptations do not imply that the problem has been resolved and should not be confused with resilience. While some citizens, for example, are answering the call to work in fields and greenhouses around the Nordic Region, there are still significant labour shortages.

Only time will tell if the food system has been resilient enough to handle all of the shocks brought on by COVID-19 and which new patterns will begin to take root in the medium- and long-term. *How will we answer this wake-up call? Will we remember the onset of the Covid-19 pandemic as a critical moment in the transition to more economically, socially, and environmentally sustainable food systems?*

Planning for the future

Prioritising resilience is the best way to buffer the Nordic food system from the future shocks that will inevitably come. Planning for the future will require a comprehensive assessment of the vulnerabilities and an understanding of what the magnitude and breadth of impact would be if the vulnerabilities were exposed. In fact, this assessment is critical to the development of future policies.

Now is always the best the time to act

To initiate a conversation about building and maintaining resilience, it is important to ask the following questions:

- Where are our greatest vulnerabilities, and what would be needed to reduce those vulnerabilities?
- What actions are already underway to strengthen food system resilience, and where are some vulnerabilities going unnoticed/unaddressed?
- What are the most significant vulnerabilities that exist beyond our borders?
- What does a resilient food system look like in the Nordics? Resilient to what? Resilient for whom?
- Where are exemplars of resilience in Nordic food systems, and what can we learn from them?

Assessing the vulnerabilities of Nordic food systems – beyond just those exposed under the COVID-19 pandemic such as erratic weather patterns and the loss of biodiversity – will require a synthesis of existing knowledge. A comprehensive assessment of this scale has never been carried out in the history of Nordic co-operation. This would then need to be put into context through a systems-based analysis of the vulnerabilities. From here, a diagnosis could be made of how to address some of the root causes and drivers of the vulnerabilities by building up resilience in the system.

This effort cannot be done alone. In fact, building resilience implies collaboration. There is already a lot of work occurring in the Nordic Region to build resilient food systems. Unfortunately, a lot of this work is fragmented or hyper-local in nature and needs to be mapped. Mapping makes sense to avoid duplication, scale up existing efforts, and share learning and experiences.

Only after developing a clear overview and understanding of food system vulnerabilities can clear goals and an action plan for resilience be developed, incorporating the principles of resilience. We must orient our future food policies around resilience to help weather long- and short-term disruptions. Now is always the best the time to act.

Notes

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