MISTRA FOOD FUTURES

Policy brief

Improved preparedness with respect to food can be achieved through sustainable and resilient food systems – examples from Sweden

This policy brief introduces how improved food preparedness can be achieved through methods that simultaneously reduce the negative impact of the food system on climate and the environment by focusing on actions that lead to a more resilient food system. By prioritizing increased resilience, both improved food preparedness and a development in line with a more sustainable food system can be achieved. We use examples from the Swedish food system, but the approach should be useful also for other food systems.

Dual challenges

The Swedish food system faces dual challenges - sustainability transition and transition to improved food preparedness - both of which require significant investments and changes in behaviour. Research on measures to reduce the climate impact of the food system (1-4) supports the hypothesis that transitioning to a more sustainable food system could go hand in hand with a process to achieve improved food preparedness, as these measures contribute to enhanced resilience. However, in ongoing societal discussions, the sustainability transition of the food system and the improved food preparedness are mainly treated as separate areas. This risks creating inefficiencies, particularly through investments in improved food preparedness in a system that is fundamentally unsustainable.

Access to safe and healthy food in sufficient quantities is a fundamental human right (5). In Sweden, conditions for securing food availability through both domestic production and international trade have long been favourable and stable, and therefore, food preparedness has not been a prioritized area. Food systems are globally vulnerable to crises (6-8), and in the wake of recent crises including Covid-19, extreme weather events such as droughts and floods, and the changing geopolitical situation linked primarily to Russia's invasion of Ukraine, vulnerability has increased and become more apparent. The development following these crises clearly demonstrated how interconnected supply chains are regarding inputs to agriculture and food production at large. International trade is fundamentally beneficial and has promoted development,

RECOMMENDATIONS

1. Measures for improved preparedness with respect to food should go hand in hand with the sustainability transition of the food system.
Simultaneously transitioning activities of the food system on multiple fronts.

2. Supplement short-term solutions with long-term strategies.
A system built on resilience is prepared not only to withstand disruptions but also to adapt to them.

3. The knowledge exists to create sustainable preparedness already.
Existing individual measures that can help reduce the carbon footprint of agriculture while simultaneously enhancing the system's resilience to disruptions."

especially in stable times. However, during various crisis, it can lead to increased vulnerability. In Sweden, an intensified discussion about improved preparedness in the food system has emerged and been concretized by the government assigning a special investigator to propose the direction for food preparedness (9).

At the same time, the food system needs to transition to a more sustainable system, both environmentally, socially, and economically. Globally, food systems account for approximately one-third of greenhouse gas emissions (10). In Sweden, territorial emissions from agriculture account for about 15% of the country's total greenhouse gas emissions (11). Monocultures and agricultural landscapes threaten the biodiversity of cultivated landscapes. The food system also has a negative impact on public health; as many as 50% of the adult population in Sweden are overweight or obese (12), which is likely due to a food environment that does not support healthy food choices.

Scientific background to the recommendations

1. Measures for improved preparedness with respect to food should go hand in hand with the sustainability transition of the food system.

Preparedness with respect to food and the sustainability

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transition of the food system should be seen as interconnected policy areas. The transition to a sustainable food system poses significant challenges and investments for farmers, food processing industries, trade, and consumers alike. It entails reorienting activities across multiple fronts within the food system: improving and changing agricultural production practices, altering value chains and activities in the processing industry, and changing dietary patterns. Specifically, this involves well-planned crop rotations, nutrient recycling from society, use of fossil-free fuels, expansion of irrigation and drainage, and a shift towards more plant-based diets, to name a few major areas.
Establishing food preparedness within the current food

Foto: Jenny Svennås Gillner

system, without simultaneously leveraging the opportunity to transition towards a more sustainable food system, risks inefficiencies. This is because necessary investments and changes in behaviours, decisions, and methods within the food system cannot reliably serve both purposes, unless clearly designed to do so. Consequently, this may lead to resource waste and unnecessarily costly processes.

The scientific literature describes the phenomenon of path-dependency (13), wherein past investments and decisions influence future choices. An integrated approach to the comprehensive changes required in the food system could be facilitated by treating improved food preparedness and sustainability transition within the food system as interconnected policy areas. This would ensure that public investments in both these areas can mutually reinforce each other.

2. To establish food preparedness, short-term solutions such as building up stocks need to be complemented with long-term strategies to ensure resilience over time.

Food system preparedness has come to focus on short-term resilience, such as stockpiling inputs and products in case of disruptions in supply chains (14). Stockpiling can help manage short-term disruptions. However, a system built on resilience (15) is prepared not only to withstand disturbances but also to adapt to them. If necessary, the system is flexible enough to transition to function in a fundamentally different way, while continuing to deliver despite interruptions and disruptions in current supply chains.

The scientific literature describes three components of achieving resilience in agriculture (15), which are also relevant for the resilience of the entire food system:

Robustness: This involves the capacity to withstand disturbances. Stockpiling can be helpful in this regard.

Adaptability: This involves the capacity to adapt to disturbances, such as using alternative supply chain, inputs, production methods, etc., to manage disruptions.

While stockpiling alone may not be sufficient, adaptability can be supported by diversified systems (in terms of crop and livestock diversity, as well as diversity in production methods and types of food processing) that spread risks and mitigate disruptions.

Transformation: This involves the capacity to significantly reorganize operations within organizations to produce differently than before when disruptions from the surrounding environment make continued use of existing methods, inputs, structures, etc., impossible. Here, flexibility to rethink and adopt alternative approaches is crucial, while ensuring the overall food system's ability to continue delivering healthy food in sufficient quantities.

3. The process of establishing sustainable preparedness can begin where research already indicates opportunities to reduce the climate impact of the food system while enhancing its resilience.

Within research programme Mistra Food Futures, we have investigated how around twenty individual measures can contribute to reducing the carbon footprint from agriculture. A closer look at these measures highlights that several of them can also enhance the system's ability to withstand disruptions, i.e., resilience, particularly concerning disruptions in supply chains linked to increased geopolitical tensions.

One example is self-driving electric tractors. These provide significant climate benefits and can be powered by electricity generated from solar and wind energy on the farm, independently of whether the national power distribution system is functioning or not (1). They can also be run on Swedish electricity if international trade and logistics systems would, for some reasons, stop working.

Another example is feeding pigs with a significant portion of forage. Not only is this beneficial for the climate, but it also reduces the need for imported feed (2) and decreases the need to feed pigs with food that humans could consume directly.

A third example is lipid-producing yeast fungi that can produce fat if fed with something as inedible for humans as straw or wood. The fat can be used as a raw material for biodiesel production to reduce dependence on imported diesel, but it can also be used to replace rapeseed oil in, for example, fish feed (3).

Yet another example is the cultivation of cover crops, which contributes to reduced climate impacts, and by using the biomass as a raw material for biogas production, it also enhances resilience. This, in turn, results in even greater climate benefits (4).

By starting where we already know that there are good opportunities to reduce the food system's climate impact while increasing its resilience, improved food preparedness and development towards a more sustainable food system can thus go hand in hand.

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These recommendations have been developed through collaboration between researchers in Mistra Food Futures (Mistra DIA 2018/24 #8) and researchers in the project Towards Sustainable Preparedness in Swedish Agriculture (Formas dnr 2022-02393). The researchers are responsible for the content of the document.

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About Mistra Food Futures

Mistra Food Futures is a research program at SLU. Our main partners are SLU Swedish University of Agricultural Sciences, the Stockholm Resilience Centre (SRC) at Stockholm University, and RISE. We provide an interdisciplinary perspective on the Swedish food system. In dialogue with external stakeholders, we develop strategies for the Swedish food system to achieve economic, social, and environmental sustainability and resilience.

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