



Jordan Country Foresight Report 2023-2025

Foresight for Food System Transformation (FoSTr) Programme



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1.1 Setting the scene

Jordan's food system is currently at a critical crossroads. Transforming the food system of Jordan is essential to address interconnected challenges of food insecurity, malnutrition, environmental degradation, and rural poverty. Transitioning to a sustainable food system promises improved quality of life, building healthy societies, and retaining a thriving ecosystem. This transformative action, however, necessitates a paradigm shift grounded by replacing linear approaches with holistic systems approaches.

Such a transition can only be realised if actors in the food system collaborate and align. This includes public officials, members of the private sector, civil society organizations, citizens, and international partners are actively engaged in understanding and deliberating on their food system future. For example, including farmers into the discussion brings insights to whether future production strategies should focus on enhancing efficiencies in conventional practices or alternatively adopting new technologies. Bringing the discussion to citizens (seeing them as more than consumers) allows for better linkages between consumption needs and empowerment to take action. A better understanding of drivers of food loss and waste means understanding farmer practices, processor business models and consumer behaviour, allowing policy makers to design effective tools and incentives. The challenge, however, manifests itself in the potential of formulating an effective policy framework guiding systems transformation, navigating trade-offs and supporting decisive action.

It is essential to no longer wait for change. Waiting for programs to be set up, complete data to be collected or investments to materialise implies delay. With the collective effort of Jordan's citizens, transformative action can be taken. In the FoSTr programme, foresight and futures thinking were applied to anticipate and shape long-term change, enabling stakeholders to plan resilient strategies rather than react to crises. The foresight process brought together diverse actors to analyse trends, identify uncertainties, and construct scenarios to support the Jordan food system transformation agenda.

1.2 The foresight process

In order to be ready for the future, FoSTr Jordan has supported the Higher Food Security Council - led by the Prime Minister but representing several ministries, institutions and stakeholders from public and private sectors - by:

- **Organising a diverse range of multi-stakeholder workshops** in Jordan since 2023, involving a range of participatory tools and in-depth working sessions, which involved 100+ from the food security sector as well as other sectors in Jordan and other countries across the region. These sessions, among others, included:
 - Working with diverse food systems stakeholders to map food systems, identify critical uncertainties and develop future scenarios
 - Working sessions with knowledge institutes
 - Strategic sessions with key champions of change, including business leaders under the umbrella of the Chamber of Commerce and Chamber of Industry, and members of the Senate Agriculture and Water Committee
 - Workshops in Governorates across Jordan: Tafila, Karak and Irbid
 - A high level 'Foresight for Systemic Policy-making workshop' attended by 13 different government ministries and 5 representatives from countries in the Arab region
- **Developing a [Jordan Food Systems Map](#)**, with input and validation of Jordan food systems stakeholders.
- **Developing and presenting 9 policy briefs**, focused on key issues, including: [Tackling malnutrition in Jordan](#); [Water to Food conversion](#); [Food loss and waste](#); [State of smallholder farming](#); [food governance](#); [role of private sector](#); [role of civil society](#); [vegetable and fruit whole-sale markets](#); and a final overview paper on entry points for systems change.
- **Exploring and modelling the implications of two key scenarios for Jordan's food system in 2050**: a business as usual and a desired plausible future, each with very different trade-offs and challenges.

In our work, three strategic leverage points for systemic change emerged. If triggered and pushed together in an integrated and holistic way, these may support transforming the food system of Jordan towards a more sustainable future:

- Reducing food loss & waste: best for sustainability
- Shift to Mediterranean diet: best for human health
- Economic growth & tech change: best for ensuring food security

Investing in a process to guide and facilitate transformation along these leverage points is essential. These areas cannot be successfully addressed without changing mindsets about food; breaking down barriers between stakeholders, which is crucial for fostering collaboration and achieving mutual benefits; and harmonization of efforts across different

sectors, which is needed for open dialogue and coordinated actions. These leverage points can be achieved through circularity, innovation, cross-sectoral collaboration, but need to work in tandem with reform to national food policy, meaningful corporate commitments and a rebalancing of power within the food system.

1.3 Key insights & recommendations

Transforming food systems requires a holistic systems approach and understanding of dynamic relations between food systems actors.

Communication and collaboration are essential components of this approach. By fostering open dialogue and coordinated actions, stakeholders can work collectively toward shared goals in food security and sustainability. A transformative systems approach also necessitates leveraging foresight knowledge for informed decisions while being able to manage trade-offs and coming up with the best options to navigate an uncertain future. Knowledge and information sharing among all stakeholders, including users and decision-makers is therefore important. Breaking down barriers between stakeholders is crucial for fostering collaboration and achieving mutual benefits. Only by harmonising efforts and trust building across different sectors can food systems transformation processes be guided.

Key enablers towards transformation are located across society, in government, private sector, knowledge institutes and civil society.

Each can work on essential issues: structured and intersectoral policy action, sustainable business models, activating of civil society energy, and knowledge



for action. Strong alliances of cross-sector champions are needed who shared an aligned vision for a sustainable and inclusive food future of Jordan – while having the capacities and ability to recognise and appreciate the diversity of perspectives and contributions each brings.

Six key general policy recommendations have been identified, emerging from the engagements since 2023. More specific recommendations on various themes have been made in 9 policy briefs by FoSTr, which can be found [here](#).

1. Promote dietary shifts and a new food culture
2. Prioritize cutting food loss and waste
3. Integrate policies across sectors
4. Make climate resilience a high priority for investment in agriculture, supporting agricultural practices and technologies that build resilience without increasing environmental footprints
5. Stimulating multi-sector partnerships between public and private actors for sustainable innovation is central to success.
6. Enhance participatory foresight and systems approaches

The following report will share the FoSTr Jordan process and more information on how we came to these key insights and recommendations.



2. Introduction

2.1 The FoSTr programme

Our national food systems are not effectively delivering the food and nutrition security, decent economic livelihoods, and environmental sustainability we all need. We are living in turbulent and rapidly changing times, as substantial uncertainties and systemic challenges are appearing, including the impacts of climate change, shifting diets, disruptive technologies, trade tensions, price fluctuations and hikes, and the impacts of pests, diseases, natural disasters and conflict. The world is increasingly behind on achieving the SDG targets, many of which depend on changing our food systems for better health, livelihoods and environment. We will not get there by improving efficiency only: transformation is essential. But there are also increasing uncertainties on such pathways of change, ranging from less predictable weather conditions to regional instability or consumer behaviour. Transforming food systems will require imagining different futures in the way food is consumed and produced. This change requires consumers, producers, agri-food businesses and policy actors to revisit their assumptions and reframe their understanding what food systems should deliver, how they function, and the incentives that drive the behaviour of actors in the system.

FoSTr in Jordan

The Foresight4Food Initiative (F4F) uses foresight and food systems approaches to support national food systems transformation pathways. F4F fosters a deeper understanding of the complexities within food systems and drive impactful decision-making by facilitating informed and strategic dialogues between government, private sector, science, and civil society. Foresight4Food implements the 'Foresight for Food Systems Transformation' (FoSTr) programme, which is financed by the Kingdom of the Netherlands, overseen by IFAD and led by the University of Oxford's Environmental Change Institute and Wageningen University & Research. Foresight4Food operated in Bangladesh, Jordan, Kenya and Uganda. In Jordan, Foresight4Food is partnering with Jordan University of Science and Technology and University of Jordan.

FoSTr supports the Jordan Food Systems Transformation using foresight approaches. This involves creating a joint understanding between stakeholders on the current food system, exploring and analysing the implications of different scenarios and helping to chart a path towards a desired food system. Foresight processes that effectively integrate qualitative and quantitative information can offer options for stakeholders to be better prepared for the future. The United Nations Food Systems Summit and the National Pathways for food systems transformation have put the spotlight on the critical need to work on food systems change across multiple scales. It is increasingly clear that we need to understand and engage with the process of food systems transformation, and this requires many different aspects of society to start working in tandem to realise change.

2.2 The need to transform food systems

More than ever, longer-term perspectives are needed to underpin efforts to enhance the performance and sustain the food system. The Jordan food system has evolved over many years and has shown a high level of resilience to outside influences. How can Jordan and its food system stakeholders be prepared for the risks at long-term? How can we build inclusive opportunities and mitigate the effects of risks that may affect the performance of the food system? These are legitimate questions that need to be answered.

The Jordanian food system delivers a variety of outcomes to society, including the capacity to feed its population, contribution to the GDP, improving livelihoods and a reduction in severe undernourishment. Several issues affect and influence the food system in Jordan. These include unhealthy diets, unsustainable and inefficient use of natural resources, low investments and budgets, high food loss and waste, slow innovation pace and frequent changes in policies and management. Malnourishment continues to exist amongst key population groupings (e.g., refugees), anaemia is prevalent and obesity is becoming more widespread. Income inequality is persistent, the food system is sensitive to global and regional political-economic volatility, and it is affected by climate change and water scarcity. The National Food Security Strategy 2021–2030 signals Jordan's commitment to food security and systems development. The foresight analysis assists with creating an overview to build a collective understanding of key dynamics in outcomes, drivers and activities.

Understanding 'food systems': A food system encompasses all activities needed for food to end up on people's plates. For society, food systems need to deliver on three key outcomes: food and nutrition security, economic and social well-being and environmental sustainability. Food systems involve an interconnected set of value chains, from production to consumption, a range of supporting services, and an institutional environment of formal and informal norms and rules, mindsets and power relations, which shape how actors behave. How food systems evolve over time is influenced by a set of drivers and feedback loops, both internal and external to the system. To help explain these dynamics of food systems, Foresight4Food uses the model shown below.



2.3 Foresight and futures thinking

Foresight integrates a range of methods and tools for exploring the future. It includes horizon scanning, stakeholder analysis, mapping systems, data modelling, scenario development, trade-off analysis, visioning, and theory of change analysis. A wide range of participatory stakeholder engagement tools can be integrated into the overall process. Foresight is all about 1) being better prepared for a range of different situations that may have to be faced in the future; 2) helping to create the understanding, vision and ambitions needed to steer towards more desirable futures and away from less desirable ones; 3) providing a basis for assessing a range of different options and pathways for realising policy objectives; and 4) 'stress testing'

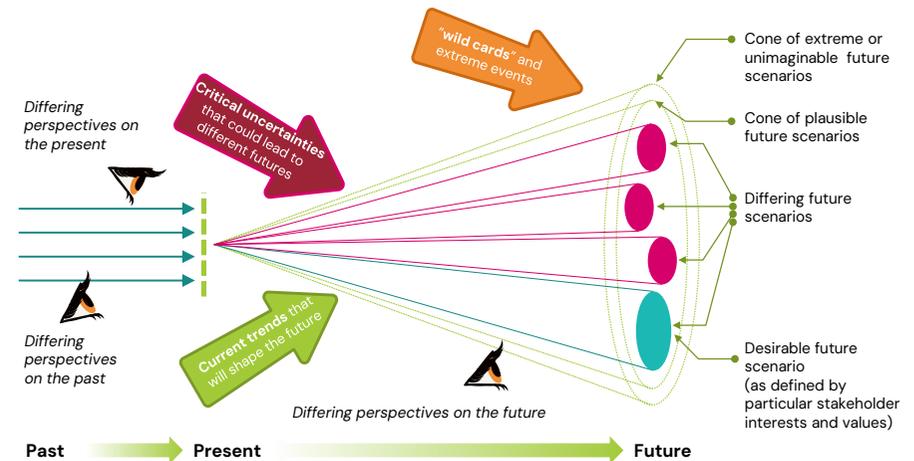


Figure 2: the Futures Cone

how effective different policy, strategy and investment options might be in different scenarios.

Foresight and scenario analysis help us prepare for uncertain futures by asking "what if?" In essence, scenario analysis means exploring what different situations may be faced in the future and considering the options available. This opens space for anticipatory governance enabling better and more timely decision making. For example, what happens in 30 years' time if most people on the planet are eating an unhealthy high salt, high fat, high sugar and high animal protein diet? Or, what if climate change impacts on food production in more or less extreme ways? See the 'futures cone' figure above.

Foresight sits at the interface of uncertainty about the future and human agency to steer change. Many governments and businesses have foresight, scenario or futures units to guide their decisions and policy making. Foresight approaches underpin work by many national governments and global business associations to help navigate an uncertain world. Foresight is used in major environmental assessments, such as the International Panel on Climate Change. Foresight does not try to fully predict or project the future (an impossible task), rather, it helps to navigate future uncertainties and turbulence. Rare or unexpected events do have a dramatic influence on how the future unfolds. However, the future is also shaped by purposeful human intervention. Humans have tremendous capability to organise, communicate

and create shared narratives about the future they desire. We are not simply victims of a pre-ordained future. Foresight is about enhancing the capability to shape the future in desirable ways, departing from the perspective that future is shaped by natural dynamics and human intervention.

2.4 A guiding framework: foresight for food systems change

To use foresight for food system change, the Foresight4Food Initiative has developed a guiding framework. Illustrated below, the framework covers a four-step process, with an emphasis on participatory stakeholder engagement supported by a strong evidence base. Each step has a set of participatory and analytical tools. The framework integrates the use of evidence about food systems change and modelling with participatory processes of stakeholder engagement and dialogue via scenario development.

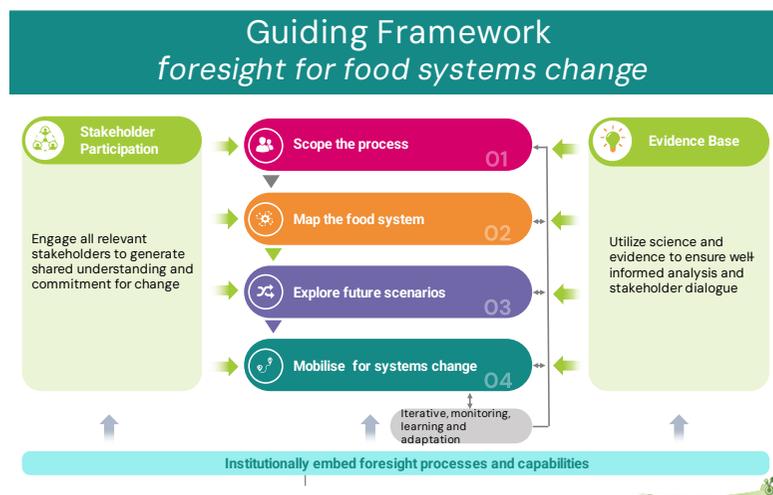


Figure 3: the Foresight4Food Guiding Framework for foresight for food systems transformation

A core assumption of the Foresight4Food framework is the value of stakeholder dialogue across government, business, civil society and research informed by the best available evidence and effective data visualisation. The foresight framework links food systems mapping and scenario development to policy processes to achieve food systems change. The Framework has been designed to integrate food systems mapping, futures thinking and scenarios, and thinking about how to bring about change in complex and continuously

changing food systems. This brings a strong emphasis on understanding the political economy of food systems and how power relations can enable or constrain opportunities for change.

Using foresight to support national food systems transformation pathways. Initiated by the United Nations Food Systems Summit, Jordan and most countries developed and implementing national food systems transformation pathways. To be effective these pathways will need to take a medium- to long-term perspective and prepare countries to cope with a range of future stresses and shocks to food systems. Foresight and scenario development can be a vital part of this transformation process. Transformation at local levels, across value chains and within agri-food sector businesses are needed for national pathways to achieve their objectives. Foresight can support the stakeholder engagement and evidence-based analysis needed to prepare our food systems for the future.

2.5 Scoping the process

Since arriving in Jordan at the end of 2022, the FoSTr programme partners have sought to work contextually, with national partners and driven by demand. This included high attention to scoping and defining the key questions and boundaries of the Jordan food system. Additionally, FoSTr built relations with key government partners to support the national food systems transformation agendas.

Ownership and buy-in is vital for achieving and sustaining foresight results. In this regard, the government of Jordan adopted and applied an active participatory and engaging approach, by 1) having all relevant ministers as members in the Higher Food Security Council (HSFC); 2) all relevant institutions being members in the four HFSC committees, and 3) foresight training provided to other line ministries in Jordan.

Country facilitators Dr Walid Abed Rabboh and Dr Asem Nabulsi were the country facilitators for FoSTr in Jordan. Through their efforts, commitment and networks, the foresight process in Jordan was managed effectively and smoothly, achieving consistency and avoiding contradictions and overlaps. The country facilitators actively connected with the international initiative facilitators and the national research partners, working together to provide technical, managerial and policy support to different food systems stakeholders.

The programme sought to establish partnerships and strong relations with the immediate stakeholders especially research, knowledge and innovation institutions, in this regard, agreements have been signed with the University of Jordan and University of Science and Technology to provide technical support and participate in preparing policy briefs in wide range of subjects.

The Higher Food Security Council and its standing committees are the direct and highest bodies in Jordan that govern food security in Jordan. Moreover, several stakeholders have direct or indirect roles in the transformation of the food system. During the past few years, Jordan exerted major efforts to promote the transformation in its food system including:

- Endorsement of the Food Security Strategy
- Development of the Food System Transformation Pathways
- Development of the Food System Transformation Roadmap
- Developing scenarios for the future food systems,
- Establishment of the Food Security Management Information System
- Launching the No Food Waste Initiative.

FoSTr has partnered and supported the food system transformation process in several ways by providing training to stakeholder institutions and individuals, preparing several studies and policy briefs (9), building cooperative agreements with UOJ, JUST and NAJMAH, providing policy advice to the government – especially Higher Food Security Council, Ministry of Agriculture and Ministry of Planning and International Cooperation, and promoting knowledge and experience sharing with other countries involved in FoSTr (Uganda, Kenya and Bangladesh), but also other ministries in Jordan and with member countries of the Arab Organisation for Agricultural Development (AOAD) including representatives from Ministries of Agriculture from Tunisia, Lebanon, Sudan, Somalia and Yemen.

FoSTr has engaged actively with several line ministries who have a stake in the food system transformation. Beyond the ministries mentioned above, these included the Ministry of Industry, Trade and Supply, Ministry of Health, Ministry of Water and Irrigation, Ministry of Social Development, Ministry of Social Development, Department of Statistics, Jordan Credit Corporation, Chambers of Commerce and Industry, Universities (mainly University of Jordan and Jordan University of Science and Technology but also University of Petra), Consumer Protection Association, Alliance Against Hunger

and Malnutrition, WFP, FAO, UNDP, Farmers Association, Date palm Association, producers and exporters associations, and the Amman Whole Sale Market.



3. Mapping Jordan's Food System

3.1 Why map the food system?

A comprehensive understanding of the food system is essential. This is needed to identify and assess key drivers, trends, and uncertainties, which form the basis for the development of future scenarios. The first phase of the foresight process therefore focused on mapping the Jordan food system to establish a shared understanding among stakeholders. This phase also involved compiling and visualising relevant data on historical and projected trends, assessing the political economy and power relations, and identifying enabling and constraining factors for change. The resulting synthesis provided clarity on system boundaries, trade-offs, and synergies, and highlighted areas where additional information was needed. Together, these insights laid the foundation for the subsequent stages of the foresight process.

A food system encompasses many elements and dynamics. All activities, processes, and actors involved in the production, processing, distribution, consumption, and disposal of food, with the aim of ensuring food security, safety, and sustainability, while influencing health, the economy, and the environment. These systems are shaped by a wide range of interconnected factors, commonly referred to as drivers of food systems. Bene et al. (2020) define food system drivers as endogenous or exogenous processes that, deliberately or unintentionally, influence a food system over a long period, durably altering its activities and outcomes.

Conducting this mapping together with Jordan food systems stakeholders is crucial. This helps to get a shared understanding on how activities and issues are interconnected and how they interact with one another. Food system mapping reveals relationships and dependencies among actors such as farmers, consumers, retailers, and policymakers, and helps identify local resources, agricultural strengths, and existing infrastructures, including markets and transportation systems, that shape the system. In the Jordan context, these mapping processes actively engaged diverse stakeholders and applied foresight tools to explore multiple future scenarios, fostering collaboration and creating a shared understanding of the food system.

The Foresight4Food food system framework was adopted as indicated in chapter one (Figure 1, see section 2.2). This framework builds on previous work and incorporates elements of the food systems framework developed by Ingram (2011), HLPE (2016) and van Berkum et al. (2018). The framework was used as a basis for describing the food system while customising specific elements to the Jordan context. It was also used to scan for trends relating to the food system and to detect major drivers behind it. This framework describes the main components of a food system: activities, support systems, drivers and outcomes.

Mapping the Jordan food system consisted of several sequential steps. First, all activities, actors, outcomes, and drivers of the system were described, drawing on a diversity of data sources to provide a comprehensive picture. Second, this initial mapping was validated with a diverse group of stakeholders, ensuring that multiple perspectives and local knowledge were incorporated. Third, causal relationships, feedback loops, and interlinkages between different components of the system were identified, highlighting how changes in one part of the system could affect others.



An Overview of The Jordanian Food System: Outcomes, Drivers & Activities



[Food system analysis report, access via this link](#)

3.2 Gathering food systems data

How was it done? Mapping Jordan's food systems was undertaken by the Foresight4Food team from University of Oxford and Wageningen University and Research including the country facilitators, with input and validation from food systems stakeholders during a workshop in May 2023 and inputs and data from Jordan research partners. The research conducted a food system analysis identifying food system outcomes related to food and nutrition security, socio economic outcomes and environmental outcomes; food system actors and their activities; and drivers and trends of the food system.

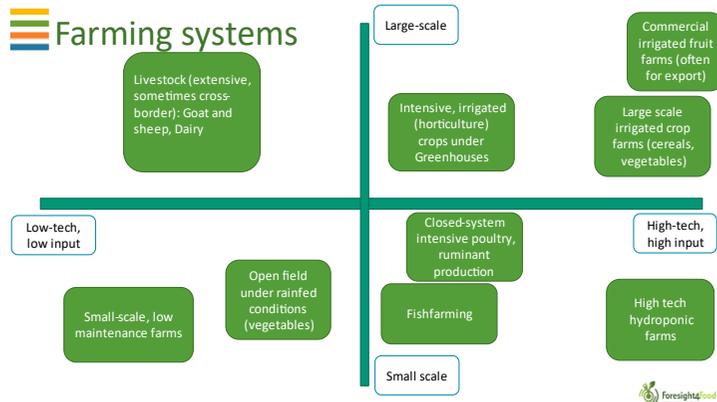
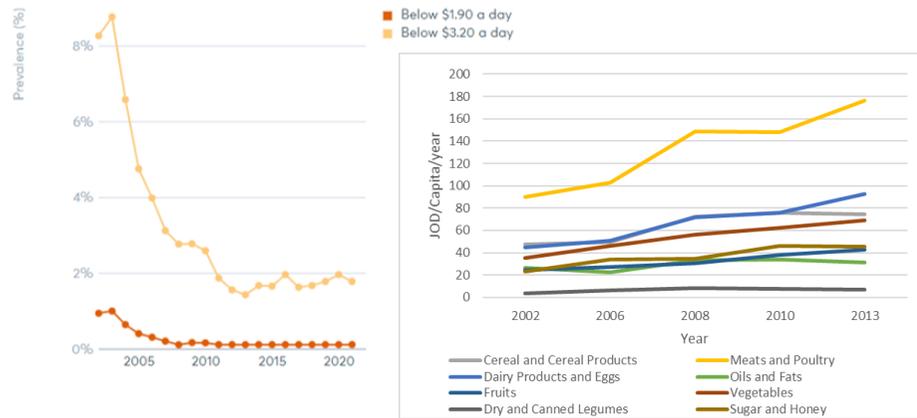


Figure 4: Jordan food systems stakeholders engage in a 'data walk' to examine and discuss key drivers and trends of the Jordan food system

A desk review was undertaken by the research team processing all relevant literature. The documents reviewed included government documents and technical reports of food systems.

3.3 Highlights from the food system analysis

Catering to the needs of more than 11 million inhabitants across an area of 90 thousand km², the Jordanian food system is facing socio-economic, climatic and environmental challenges. Jordan's ecology is marked by arid conditions and limited water resources, resulting in most agriculture situated in the Jordan Valley, Ghor and the Highlands. The Jordanian food system is embedded within a stable political environment, with a well-educated and relatively highly urbanised population, and a significant influx of refugees (from Palestine, Syria, Iraq). High-intensity export agriculture co-exists with extensive farming systems—both rain-fed and irrigated—that are dominated by smallholders, as well as with extensive Bedouin livestock-keeping.

The Jordanian food system delivers a variety of outcomes to society, including the capacity to feed its population, contribution to the GDP, improving livelihood of farmers and producers and a reduction in severe undernourishment. Malnourishment exists amongst some population groupings (e.g., refugees), however, anaemia is prevalent and obesity is becoming more prevalent. Income inequality is persistent, the food system is at least partially sensitive to global and regional political-economic volatility, and it is affected by climate change. The National Food Security Strategy 2021–2030 signals Jordan's commitment to food security and systems development.

Highlights of the Jordanian food system:

1. Progress towards global nutrition targets: Although only 3% of all Jordanians are experiencing severe undernourishment, the rate of undernourishment amongst the country's large refugee population is 21%, and two thirds are at risk.
2. Changing consumption patterns and obesity: The national average intake of food groups associated with health and environmental impact (e.g., red meat, fish and dairy) by adults 20 years of age and older significantly exceeds the recommended daily intake. The expansion of supermarket and fast-food retail sales, in which profits are derived primarily from processed foods, has contributed to shifts in dietary choices, leading to a rise in obesity in more than half of the adult population. In 2019, more than 46% of women older than 18 years were obese, 37.7% of women of reproductive age (15–49 years) were affected by anaemia, and 18.9% of all women (18 years or older) had diabetes.
3. Rising food prices: Since 2015, the consumer price index for food has increased by more than 5%, thus having an impact on the affordability of a healthy diet, particularly in terms of meat, poultry, legumes and fruit. Jordan is also highly dependent on global markets, as it imports around 70% of its staple food needs.
4. The food processing industry is growing and drives an increased demand for ingredient inputs, which is expected to double in the next five years.
5. Water stress and climate change: Levels of water stress have doubled since the 1970s, reaching a peak of 103% in 2014. The agricultural sector uses more than 50% of the country's available water resources. Climate change could further reduce water supply and crop productivity, thereby potentially decreasing Jordan's GDP by as much as 6.8%.
6. Declining agricultural employment: In 2021, the agricultural sector employed only 2.5% of Jordan's labour force, with a higher proportion of informal labour (including Asian, Egyptian and refugee workers), relative to other economic sectors.
7. Food waste: Reinforced by cultural norms, altered dietary habits have caused food waste to double over the past two decades, reaching an estimated 93 kg of food waste per person each year.

3.4 Identifying causal linkages between food system elements

Causal loop diagrams are graphical representations used in system thinking. These diagrams can help by identifying leverage points and unintended consequences, enabling policymakers and other stakeholders to design more

effective interventions and policies for enhancing food security, sustainability and resilience. Causal loop diagrams (CLD) were developed in a participatory exercise by the research team to understand the complexity of the Jordanian food system and the interaction and feedback mechanisms within the system.

In any food system, stakeholders are likely to have different interests.

Power and agency are unequally distributed, with certain stakeholders having more influence (e.g., on policymakers) than others do. This interplay between stakeholders, which creates coalitions of mutual interests, exercises power and influence and opposes other stakeholders with conflicting interests, is an important dynamic that shapes the food system. This political economic playground provides a good explanation for why a food system has great beneficial outcomes for one segment of stakeholders, while having significant detrimental effects on other segments in society or outcomes.

Examples of opposing interests in the Jordanian food system could include:

- Large-scale traders who rely on the centralised trading system, as opposed to small-scale retailers who could benefit from decentralised, direct trading
- Importers of food products, as opposed to domestic food producers
- Promotion of food exports, as opposed to local prices, especially during certain periods in which production does not meet demand at the national level, which results in a clear conflict between the interests of farmers and dealers and those of consumers

Differences in interests and imbalances in power also explain why food-system transformations towards certain improved outcomes may stagnate due to resistance. If such changes are not perceived as beneficial to powerful stakeholders, they may exercise their influence to hinder or even block their implementation (see also the following section on trade-offs).

Key dynamics and trade-offs

Based on the food systems analysis conducted on the current Jordanian food system, a number of key dynamics and trade-offs stand out.

The first is the trade-off between production of low-value crops and water availability. Jordan's agricultural development policy has favoured

export-oriented policy, without full long-term consideration to maximising the returns on each cubic metre of water. This has led to substantial amounts of water usage. In this way, the growth in Jordan's horticultural sector is having a significant impact on the availability of water, not only for agriculture, but also for industry and consumers. The increasing scarcity of water is further exacerbated by the impacts of climate change.

The second trade-off is between import dependency and food affordability. Despite its export of fruit and vegetables, Jordan is dependent on imports from abroad for the majority of its food consumption, particularly staples. Two thirds of calory consumption are imported. With increasing global food prices due to the impact of climate change, COVID-19 and the Ukraine crisis, the affordability of imported food products is under pressure. This reduces food security, especially amongst the more vulnerable parts of the population in Jordan (e.g., its large refugee population). The food system is therefore not sufficiently resilient against future volatility in international food prices.

The third trade-off is related to food waste and food security. The annual amount of food wasted in Jordan could feed 1.5 million people for a whole year. On average, each Jordanian wastes 93 kg of food each year, which amounts to around one million tonnes/year. Moreover, it has been estimated that 22% of all locally produced fruit and vegetables are lost along the various nodes of the supply chain. While economic policies have improved food security amongst the Jordanian population, the growth in food consumption and the change in diet has contributed to more food waste. Any approach to transform the food system will have to address these trade-offs.

Synergies towards food-system transformation

The transformation of the Jordanian food system towards improved economic, health and environmental outcomes will require interventions that provide synergies. We present three examples of possible synergies between desired outcomes within the Jordanian food system.

Synergy 1: Balancing water-intensive crops with economic success. At present, much of the agricultural production in Jordan, especially in the horticultural sector, is relatively water-intensive, thereby exacerbating water scarcity in the country and posing a threat to the industry's own success. Investments in less water-intensive, nutrient-rich and/or high-value crops could retain the economic success of Jordan's agricultural sector, while reducing the pressure on the country's water reserves. Policies that favour



nutrient-rich crops could positively impact availability and accessibility of healthy diets for less-advantaged households.

Synergy 2: Purchasing power vs fruit and vegetable consumption. As purchasing power increases for most Jordanians, the consumption of meat, dairy and eggs is starting to exceed recommended levels. At the same time, the consumption of pulses, fruit and vegetables remains below recommended levels, thus resulting in nutritional deficiency for large parts of the population. Efforts to promote the health benefits of eating fruit, vegetables and pulses could increase the consumption of these food categories up to the recommended levels.

Synergy 3: Food loss and waste and water conservation. Food loss and waste contribute to unnecessary water use through production and the processing of inputs and food. This is of vital importance in a country like Jordan, which suffers from acute food scarcity.

3.5 Validating findings with key stakeholders of the Jordan food system

In May 2023, FoSTR held a workshop called 'Initiating Foresight for Food System Transformation' in Amman. The workshop brought together key stakeholders from across the Jordan food system to 1) explore the role of foresight and scenario analysis in supporting processes of food system transformation in Jordan. The objectives were to 1) Share purpose of FoSTR in Jordan, contextualize and coordinate with stakeholders working on food systems; 2) Share and further build a food system mapping of Jordan; 3) Strengthen capacities on foresight and scenario processes; and 4) Generate momentum for further evidence-based and multistakeholder-driven foresight for food systems process in 2023 and 2024. The findings of the literature study were presented during the workshop.

hard to influence consumption patterns. As such, the critical uncertainty lies in the question whether it will be possible to shift consumption patterns to more healthy diets for all the different consumer groups in Jordan. To explore the implications of healthy diets behaviour, F4F team explored the future of two main diet patterns, the 'Business as usual' diet and the 'Healthy diet' in 2040, using MAGNET simulation modelling. The Business-as-usual diet is characterised by the transition toward current 'Western diets' (e.g., fast food), which challenges health/nutrition goals. This diet seems the most likely scenario if no intervention occurs, and involves people eating a diet high in animal products, sugar, wheat & tubers-based products. The Healthy diet is the so-called EAT-Lancet diet, which is healthier and more sustainable. It is high in fruits, vegetables, pulses and nuts, and low in animal foods and sugar. Each of these scenarios was explored with a number of assumptions (which need to be further adjusted), such as a certain level of economic growth, population growth, crop productivity increase (for more details, see box below).

'Ease of regional trade' is the third critical uncertainty. The war between Russia and Ukraine highly impacted global food and input prices and disrupted international trade substantially. Now, the war between Israel and Hamas has brought war close to the doorstep of Jordan. Countries in the neighbourhood such as Syria and Iraq have been unstable for decades now. Refugee influxes have often followed such crises. The reality is that the Middle East may face some form of political turbulence in the near future. However, the uncertainty lies in the extent and type of instability (war or threat of upheaval) and whether Jordan will remain untouched by this. It will be critical to examine and be ready to explore these alternative futures.

The business structure of the Jordan agri-food sector is the fourth. We saw that Jordan is home to a wide range of different farming and agri-food enterprises. A wide range of low-tech/low-intensity input and small-scale farming encompasses farming systems co-exist next to a range of high-tech/high-intensity commercial irrigated fruit farms, intensive horticulture (partly in greenhouses) and large-scale crop-production farms. We also find examples of ruminant production, fish farming and innovative pilot projects involving hydroponics. Finally, livestock production is important and often occurs in extensive grazing systems. We observed that smallholder farming in Jordan is under pressure in Jordan, as farmers face challenges to sell crops and prepare for climate change. We also see that the food retail and processing sector is growing. We also observed that some farmers are able to scale to large acreages, depending on foreign labour. At the same time, globally, concentrations of companies and consolidation of supply chains is

ongoing. This leads to increased challenges for small businesses to compete. As such, this also brings the question of whether the future of the food system will have a diversity of businesses operating in the food system or rather a smaller group of larger, more technologically advanced companies.

4.2 Diets modelling

Dr Marcos Dominguez Viera (Wageningen University and Research, presented the first simulation data modelling results FoSTr conducted for Jordan during the December 2023 workshop. For this analysis, the FoSTr Jordan team used the Modular Applied GeNeral Equilibrium Tool (MAGNET) model, a so-called global general equilibrium model. MAGNET is a macroeconomic equilibrium

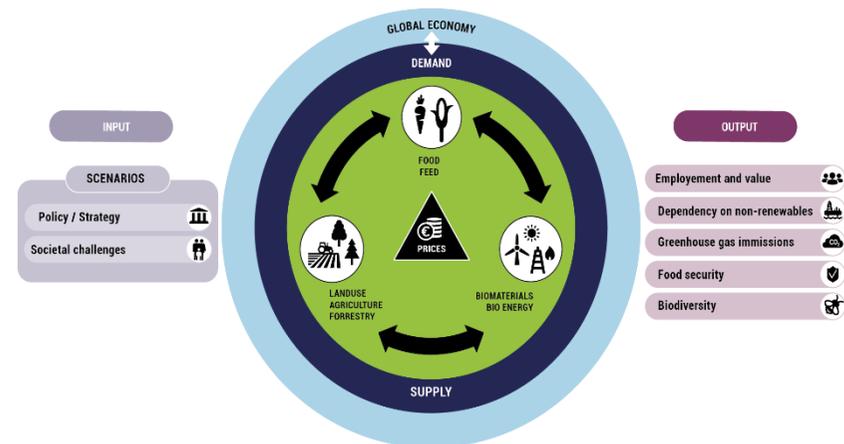


Figure 5: MAGNET model framework

model that estimates the consequences of different scenarios on food system activities, such as food production, trade, and consumption, as well as related outcomes including nutrition, livelihoods, the national economy, and environmental indicators.

The aim of the modelling exercise was to assess future scenarios for Jordan's society and environment under three different (diet) scenarios:

1. Continuation of existing consumption and production practices (business-as-usual)
2. Adoption of Mediterranean diet (culturally appropriate to historical Jordan culture)

- Adoption of a sustainable and healthy diet by the Jordan population (modelled using the EAT-Lancet diet¹)

This analysis focused a critical issue for the Jordan food system: the kind of diets the people of Jordan will have in the long term. FoSTR used for this analysis two main diet patterns: the 'Business as usual' diet and the 'Healthy diet'. The Business-as-usual diet is characterised by the transition toward current 'Western diets' (e.g., fast food), which challenges health/nutrition goals. This diet seems the most likely scenario if no intervention occurs, and involves people eating a diet high in animal products, sugar, wheat & tubers-based products. The Healthy diet is the so-called EAT-Lancet diet, which is healthier and more sustainable. It is high in fruits, vegetables, pulses and nuts, and low in animal foods and sugar. Each of these scenarios was explored with a number of assumptions (which need to be further adjusted), such as a certain level of economic growth, population growth, crop productivity increase. In the future, we also want to explore



Figure 6: Implications for economic, social and environmental outcomes across diet scenarios

¹ The EAT-Lancet diet is a reference diet designed to be both healthy for humans and sustainable for the planet, emphasising primarily plant-based foods, limited animal products, and reduced sugar and processed food intake. (Willett et al., 2019)

what the implications might be of a 'Mediterranean diet', which seems very relevant to the context of Jordan.

The key question: how would the Jordan food system outcomes (health and food security, economy and inclusivity, environment) look like in the future, and how would these change if the population of Jordan adopts a healthier and more sustainable diet? The analysis showed how each of these diets in 2050 might have an effect on healthy diets, self-sufficiency, wages in agriculture, added value of food systems, land use, water use, fertilizer application and Green House Gas emissions. These indicators are used as a proxy for food system outcomes in the MAGNET model.

The conclusion on healthy diets and self-sufficiency is that diets do not improve in the business-as-usual scenario. However, self-sufficiency deteriorates in both scenarios, even more in the healthy diet – this was a question mark, as some participants noted that Jordan has high self-sufficiency in especially vegetables (but not in nuts, pulses perhaps). On a few key example commodities Jordan's self-sufficiencies decrease: wheat, fruits and vegetables. In poultry, self-sufficiency remains high, while in animal products this deteriorates in the Business-as-usual scenario.

Wages in agriculture and added value in food systems increase in both scenarios, but with lower gains in the healthy diet scenario (as the meat and dairy industry, which regenerate high margins are much less big in that scenario). There were a number of interesting findings in the environment domain. Land use does not change much. Water needs increase to source more healthy foods. Highly intensified application of fertilisers, particularly in the Healthy diet scenario, was seen. This was a topic of discussion, but this high fertilizer applications is probably due to the fact that land use cannot change much while demands for food volume does increase. Finally, higher GHG emissions were seen in both scenarios but a slowdown in Healthy diet scenario, mostly due to a much smaller animal products sector.

4.3 Constructing two scenario narratives

In April 2024, more in-depth scenarios were explored and elaborated. This process built on the previous uncertainties, diet scenarios and had the following features:

- Stakeholders from government, civil society, and academia co-developed the scenario narratives, identifying key drivers such as dietary patterns, climate-smart and high-tech agriculture, and trade barriers.
- These narratives were translated into quantitative assumptions—for example, changes in productivity, food consumption practices, and cuts in food waste—and simulated using an economic model.
- The model tracks key outcome indicators such as household incomes, food consumption, nutrient availability, GHG emissions, and land use.

Based on discussions with stakeholders and building on a live scenario construction exercise, two core scenarios were developed for 2040:

1. A Desired sustainable future
2. A Business-as-Usual scenario



Figure 7: Discussing the implications of scenarios

Each scenario was created in the workshop by putting together a narrative, particularly for the desired future.

A Desired Sustainable Future: narrative

The desired future of Jordan food system is one where people of Jordan are eating healthy diets inspired by the Mediterranean diet, sourced mainly from Jordan and the region, improving the trade import balance. While some staple foods still need to be imported, high emphasis is placed on making food nutritious. Food resilience is enhanced through improved buffers in case of emergency and diversified food storage, but especially through enhanced coordination and cooperation among diverse food system stakeholders.

In this future, the food system of Jordan is defined by resilience and sustainability, while being open to the world through active open trade and with a thriving private sector. A diverse, dynamic and adaptive agri-food private sector is operating, together with socially-minded companies and effective agricultural cooperatives, able to also export high quality goods abroad. This is supported by responsive and inclusive financial sector. Trade is enhanced through regional agreements, simplified trade regulations and decreased customs tariffs. The economy is highly focused on circular economy using water recycling, value addition through processing, conserving, and waste into value. The focus on circular economy generates new forms of employment, contributing to natural resource management, water catchment management as well as biobased economy.

Substantial production of renewable energy through solar and wind is realised. Large investments in water management and recovery, water treatment, desalinization and rainwater harvesting do not erase the challenge of water scarcity but make it manageable, and make Jordan an example to the region. This future shows a high level of urbanisation and technology adoption, but also has many short value chains linking farmers to consumers directly. Importantly, a high degree of social engagement in food systems is present: active and healthy civil society, particularly consumer and citizen groups, successfully advocate for healthy diets, food safety and social security.

We can imagine that the agricultural sector is leaner and more efficient and focused on key healthy foods production. Other sectors are larger and invested in to generate the financial means to generate revenues and support trade, particularly retail, manufacturing, services and energy sectors.

Business as usual scenario

The business-as-usual scenario was built along the lines of many current trajectories we see now, assuming that not much action is undertaken to diverge from these trends. Key elements included that diets become more unhealthy, population keeps growing at the current pace, modest economic growth occurs but there is recurrent disruption of food trade due to regional conflicts. Climate change worsens and Jordan has to heavily cope with scarcity of water and land and existing shares of food loss and waste remain.

4.4 Implications of constructed scenarios

Based on the translation from narratives to quantitative assumptions, we used the global MAGNET model (a general equilibrium model) to simulate the socio-economic and environmental impacts of the two scenarios towards 2040: The overview below summarizes the key assumptions from each of both scenarios. It should be noted that the shape of a desirable scenario may vary, potentially leading to outcomes different from those estimated here. System change is hinged on identifying key leverage points, while identifying trade-offs and addressing potential adverse effects.

Table 1: Comparing two plausible futures for Jordan (2025–2040)

Aspect	Business-As-Usual (BAU)	Desired
Population growth	Rapid, 16 million by 2040	Slow, 13 million by 2040
Economic growth	Slow (2.6% per year)	Stronger (5.6% per year)
Food trade	Threatened by regional conflicts	Trade is enabled
Diets	Unhealthier, more Western-style eating	Healthier, Jordanian Mediterranean diet
Farming practices	Input-driven productivity, threatened by climate change	Climate-smart and high-tech agriculture

Aspect	Business-As-Usual (BAU)	Desired
Food loss and waste	Remains at current level	Cut by 50%

A comparison of two future pathways—business-as-usual and a desired scenario—reveals clear trade-offs and opportunities for Jordan’s food system. Regarding the socio-economic dimension, the business-as-usual pathway leads to more affordable food (+46%) but worsens diet quality (−11%) and reduces food self-sufficiency (−6%). The desired scenario improves all socio-economic indicators: healthy diets (+20%), self-



Figure 8: Implications of the business as usual and desired sustainable future

sufficiency (+2%), food affordability (+84%), and food exports (+82%). A highly productive agricultural sector may boost exports, but risks undermining food security by limiting gains in self-sufficiency.

In the environmental dimension, we observed that in business-as-usual conditions there is a rise in GHG emissions (+49%) and fertilizer use (+30%). At the same time, the desired scenario would have a slow-down in the growth of GHG emissions (+26%) but comes with higher fertilizer use (+67%) and moderate increases in land and water use.

Environmental trade-offs in the desired pathway are partly driven by two factors: 1) Higher demand for healthier foods (i.e., fruits, vegetables) rises domestic production, which intensifies the use of fertilizer and natural resources; 2) a highly productive agricultural sector in Jordan creates

incentives to increase domestic production for the export markets, which exacerbates GHG emissions, fertilizer use, land and water use.

Key leverage points emerging

From the analysis, the following leverage points seem crucial, but need to be operated together in order to not have negative trade-offs to other parts of the food system.

- Reducing food loss & waste is the best lever for enhancing sustainability
- Shift to Mediterranean diet is the best lever to support human health
- Economic growth & tech change is the best lever to enhance both sustainable production but especially boost earning capacity so food can be imported to Jordan

The consequence of this is that you need a bundle of options and policies rather than single focus interventions or policies. Among the interventions modelled, cutting food loss and waste is the most promising policy to enhance environmental sustainability in Jordan. It leads to reduced land pressure and water use, as well as to a slow-down in GHG emissions, At the same time, it is the only intervention with minimal negative side effects (i.e., trade-offs) for society and the environment.

By simulating and analysing the consequences of the desirable narrative for Jordan that offers a healthier, more resilient, and economically vibrant food system were compared to a future where business-as-usual conditions prevail. Environmental trade-offs under such scenario, such as increased fertilizer use from growing more healthy foods, require targeted investment in sustainable farming. Cross-sectoral coordination is essential to align health, food security, trade, and environmental goals.

Economic incentives to boost food exports in Jordan risk an "efficiency paradox," where increased domestic production could raise emissions and resource use. At the same time, ambitions to expand food exports may come at the expense of food security and self-sufficiency. On the positive side, this report highlighted that cutting food loss and waste is the best intervention for the environment. Such efforts can help mitigate environmental trade-offs in a desirable pathway, making it important to tailor such strategies to Jordan's specific context.

The analysis presented here combines qualitative foresight with rigorous modelling, ensuring both technical robustness and policy relevance. The synergies of this approach enhance trust, transparency, and stakeholder ownership of the results obtained. This participatory modelling experience provides a framework that other countries can also adopt.



Figure 9: Marcos Dominguez Viera from WUR hosting a Modelling workshop for Ministry of Planning and other government partners

5. Mobilise For Systems Change

5.1 Systems supporting a desired future food system

As a result of the consultations, discussions and policy papers recommendations that took place during the life span of the project, it has been concluded that the desired future food system (Mediterranean) for Jordan should respond to the challenges face Jordan such as water scarcity, climate change, limited arable land, reliance on imports, demographic pressures, and vulnerability to regional instability, while building on its opportunities for innovation, resilience, proximity to markets, inclusiveness and climate variability. Moreover, the future food system will be characterized by being:

1. A Healthy and Nutritious System

The desired food system will seek to transform to healthy and nutritious diet through: i) Improving accessibility to affordable, balanced diets rich in vegetables, pulses, fruits, and dairy, reducing reliance on calorie-dense but nutrient-poor imports, ii) Promoting and wide spreading school and community nutrition: Integration of local produce in school feeding programs and awareness campaigns to combat obesity and malnutrition, iii) Enforcing Food safety standards and consumer trust in food quality.

2. A Sustainable and Resource-Efficient System

Following are the major requirements for a sustainable and resource efficient food system in Jordan: i) Applying irrigation water that achieve highest efficiency and profitability by widespread drip, hydroponics, aquaponics and wastewater reuse to minimize pressure on scarce water resources, ii) Adopting climate-resilient practices such as, drought- and heat-tolerant crop varieties, minimum tillage, regenerative farming, and agroecology to sustain productivity under climate stress, iii) Reducing food loss and waste across the value chain; recovery of nutrients, energy, and compost from organic waste.

3. A Self-Reliant and Diversified System

The desired future food system will: i) Reduce import dependency through promoting local production of strategic staples, fruits, and vegetables to ensure food security, while balancing with smart trade for efficiency, ii) Diversify production base by providing due support for smallholder farmers, cooperatives, and women- and youth-led agri-enterprises in agriculture, food processing and services, iii) Adopt Green value chains that Promote local processing, storage, and cold-chain infrastructure to strengthen resilience and competitiveness.

4. A Well-Governed and Coherent System

The desired food system shall build on good governance principles and match the new modernization vision mainly through having in place coherent policies, integrating of WEF nexus planning and approach and give the private sector, women and youth active roles all through the transformation process.

5. An Innovative and Knowledge-Driven System

Adoption of innovative technologies and approaches will be the major factor of competitiveness in agriculture and food industry, hence, the desired food system will build on: i) Use of digital agriculture, including AI, sensors, and mobile platforms for precision farming, weather forecasting, and market access, ii) Build joint research and technology transfer partnerships with universities and international centres, iii) Encourage food entrepreneurship to support start-ups in agriculture and food technology.

6. An Inclusive and Equitable System

The desired system will: i) Empower women and youth through, providing equal access to land, finance, technology, and markets to ensure marginalized groups contribute and benefit, ii) Create jobs all through the production, supply, processing and retail nodes, iii) Enhance social protection

interventions such as safety nets for vulnerable groups, ensuring equitable access to food, iv) benefit from non-conventional solidarity tools such as corporate social responsibility and tribal and community solidarity funds.

5.2 Backcasting

Stakeholders explored a timeline when certain key interventions are needed in order to achieve the desired future in 2040. Backcasting moves from the future to the current, in order to keep focus on the necessary conditions that need to be met in order to achieve the desired scenario.

Between the years 2035 – 2040, there needs to be optimal use of water resources with clear and purposeful use of scarce water resources for public wellbeing. Vibrant business models following circular economy principles are the dominant business models in Jordan’s food system. Also, agricultural landscapes are, by this time, no longer only for food but also for landscape, water catchment and ecosystem services. Integration of natural environments with urban and peri-urban settings is also progressing. 70% of Amman homes have home gardens, and 90% of houses and neighbourhoods have grey water recycling. Water treatment services are connected to food producing locations to ensure farmers have enough water.

Between 2030 and 2035, more effective, high efficiency farming systems, using new drought tolerant, nutritious varieties are financed and prioritized. New laws take effect meant to ensure healthy foods (such as a law against trans-fatty acids). New collaboration mechanisms, such as between government and private sector, as well as between government and science institutes are put in place to enhance collaboration and exchange of applied knowledge and data. National chambers of commerce and agri-food are active and supporting investments in key priority areas. Key energy production sites, water treatment plants and infrastructure projects are in place or ready to come online. A new cohort of educated youth are ready to take up new jobs on the interface of energy, water and food manufacturing. City and landscape planning follows new principles of sustainability and resilience.

Between 2025 and 2030, large-scale investments take place in three key areas: education, energy and water management. Education is the first and involves also a restructuring of curricula, to ensure the labour population of Jordan is well educated in 21st century skills, focused on sectors with high potential, involving a systems and multi-disciplinary perspective. Education also highly focuses on promoting healthy, local diets. Energy is the second: if water is to be desalinated, if energy import dependency is to be decreased to

enhance resilience, and if water treatment is to be conducted and piped throughout the country, massive investments in solar and wind energy are needed. The third sector is water management, and comprises of a variety of strategies to make water conservation, quality and usage a shared responsibility of all food systems stakeholders. This means that farmers get involved and trained in water management, new projects for rainwater harvesting, new climate resilient varieties, water recycling innovations and landscape management are explored. Circular economy policies are drafted and adopted. Utility companies, citizens and consumers are involved in health, healthy food, and waste minimization campaigns. High efforts are also initiated by the diplomatic service of Jordan to establish more trade agreements, while trade regulations and central market governance is reviewed. Infrastructure developments meant to enhance connectivity, water and goods transport are planned and initiated.

5.3 Enablers for achieving the desired sustainable future

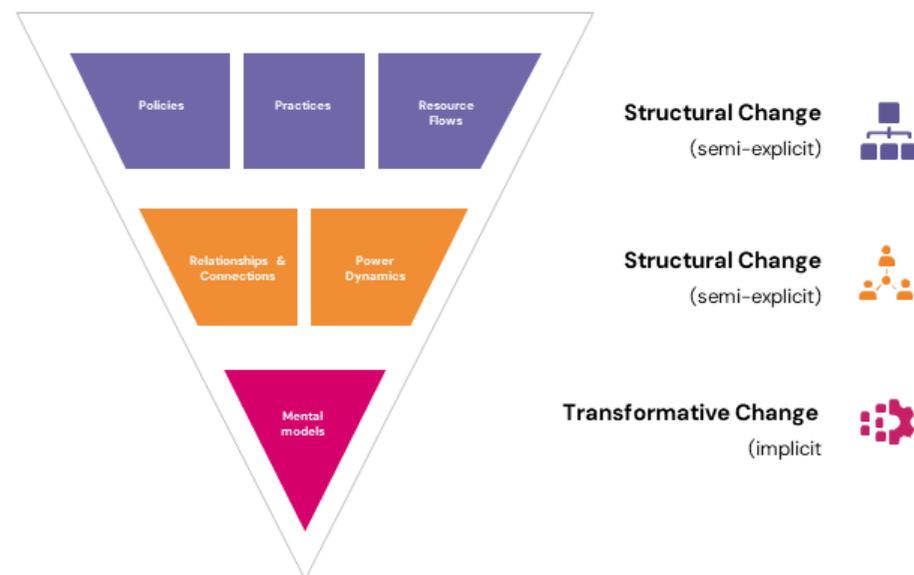


Figure 10: the Systems Change Triangle

In order to activate entry points and work towards the Desired scenario, key stakeholder groups need to be involved as enablers, work together to resolve

trade-offs, and try to remove conditions that stop the system from changing (see above figure 'Systems Change Triangle'. Foresight4Food organized working sessions with national food system stakeholders to discuss scenario implications and key insights. Public officials, businesses, scientists, civil society organizations, and consumers can use the desired scenario to explore how to co-design the pathways towards it. Discussions emphasized the following:

Structured government policy action can introduce a diverse mix of responsive policy instruments. Developing short- and long-term, and coordinated as well as decentralized strategies with measurable targets is key. Monetary regulations such as taxation, exemptions, subsidies and trade agreements serve as effective tools. Providing capacity building programs strengthen institutional knowledge and promoting informed decision making. Revising subsidies and lowering legislative barriers may encourage circular business models to boost economic growth, promote innovation, and decrease losses. While forging public private partnerships (PPPs) leverage investment opportunities. Effective tools include: training agriculture extension service providers to advise farmers on best practices to minimize losses within a changing climate, organizing local farmers markets to shorten supply chains, and modernizing public facilities through PPPs. Special attention is needed for policy coherence to ensure harmony and avoid any conflicting policies, which applies to policies across ministries and government institutions, and between different departments within a ministry.

Sustainable business models are crucial. Companies have the potential of pioneering innovation across the value chain. Technologies and digitization maximize resource efficiencies, amplify circular processes, and diminish wastage. Widespread examples are management software, storage facilities, food processing, food to feed, and waste to energy. Employing green technologies throughout production stages minimize input requirements, maximize production, and diminish waste. While adopting digital management tools at retail streamline tasks, resource planning, and demand projections. Meanwhile, collaboration between businesses further augments system competencies by empowering smaller businesses through knowledge sharing, securing markets, and access to finance. Communication platforms between private sector stakeholders are essential, between different sectors and within the same sector.

Activating the role of civil society organizations does not only voice community needs but also ensures inclusivity and equity. Social enterprises at grassroots lead the change by shifting consumer behaviour

through knowhow, awareness, and nudging strategies. For example, targeted messages through social influencers can highlight benefits of nutritional choices, understanding how to increase household savings by avoiding over purchasing or preparing large amounts of food, learning preservation techniques (through drying, pickling, freezing, or making jams), and encouraging food donations by accentuating principles of prudent spending through values and culture. Cooperatives can and should play a sizeable role in food system transformation, as they have grass root level memberships, and can bring bigger negotiating power to members for buying, selling, and access to finance.

Harnessing knowledge for action. Jordanian academic and research institutions are valuable knowledge and demonstration hubs. Engaging scientists in policymaking aid officials in making evidence-based decisions and developing measurable strategies. These establishments also provide the future generation with needed skillsets. Universities are ideal for showcasing innovation in the food system. Novel learning modules could include topics such as: climate smart agriculture, water management, experiments on animal protein substitutes, and climate related themes. They are also well-positioned to provide the needed information and recommendations at various levels of complexity in a manner tailored to specific stakeholders. Constant communication is essential in both directions, as feedback from legislators, the private sector, farmers and consumers is essential to guide research institutions towards solving issues needed by these stakeholders.

5.4 Engaging with promising agents of change

In April 2025, the focus of the FoSTr team was to explore further how different stakeholder groups how to engage in the transformation process. This entailed exploring how potential champions of change (business leaders, knowledge institutes, government actors and civil society groups) could not only learn from the two future scenarios of the food system and their implications, but also how to contribute to catalysing the enablers for change. The discussions in April were with different stakeholder groups, taking shape in the following strategic sessions:

1. Engagement with business leaders under the umbrella of the Chamber of Commerce and the Chamber of Industry
2. Engagement with key knowledge institutes, universities and educational agencies to explore how food systems and foresight thinking could be integrated into existing courses, micro-credit courses and new curricula

3. Expanding efforts to decentralise application of foresight to the Governorate level, by visiting to Tafila Governorate with NAJMAH, and hosting workshops focused on food systems, foresight and food loss and waste with three governorates (Tafila, Kirkuk and Irbid).
4. Sensitisation of the Senate Food and Water Committee, to raise the awareness and importance of food systems and cross-cutting issues for legislation.



Figure 11: Meeting with members of the Jordan Senate

Successful engagement with many of the private sector representatives, receiving their views on the scenarios developed led to new ideas for supporting the need to reduce food loss and waste and encouragement more healthy diets. The realisation that private sector can work together with civil society and knowledge institutes across different parts of the food system was important.

In discussion with policy makers at the Jordan Senate, the importance of food systems governance was underlined. This means that, while in the past various consecutive domestic policies succeeded in advancing the agricultural sector, it is realised that policies need to be 'fit for purpose', in the light of uncertainties and international drivers of change. This entails a stronger focus on multi-sectoral coherence and alignment.

Based on the interest from the Ministry of Planning and International Cooperation, Foresight4Food, NAJMAH and the Arab Organisation for Agricultural Development held a workshop on 'Foresight for Systemic Policy-making'. This highlighted the role of MOPIC in coordinating planning and modelling for the government of Jordan. This workshop, held in October 2025, involved 13 different ministries coming together to learn about foresight and practice the application in policy-making processes focused on complex systems.

Important discussions with knowledge partners focused on various pathways for integration of foresight and food systems thinking within key Jordan higher education and curricula. These entailed the integration of key concepts within existing food security, nutrition and agriculture courses, the development of micro-credential courses, and the development of new elective courses on Sustainable Food Systems.

Building on the link with the Jordan Governorates, FoSTr explored key partnership discussions with the National Alliance against Malnutrition and Hunger. The leadership of the Alliance agreed that systems change is needed, and that NAJMAH and the Jordan Institute for Human Development (JOHUD) can play a convening role across the food system of Jordan – through being present and active in many of Jordan's governorates and being a CSO supported by the Royal House. Furthermore, the topic of adaptive leadership and foresight was deemed highly important to invest in, leading to discussions on how to build the capacities of a cohort of young leaders together with the Harvard Arab Leadership initiative.

5.5 Policy recommendations

Promote dietary shifts and a new food culture: Invest in campaigns and incentives to encourage a return to the Mediterranean diet in Jordan. Develop new dietary guidelines aligned with such a diet. Uniting Jordanians around building a vibrant food culture is prompted by raising awareness, learning, and understanding consequences of inaction.

Prioritize cutting food loss and waste. Civil society organizations can shift consumer behaviour by highlighting benefits of nutritional choices, showcasing accrued savings from avoiding over purchasing or preparing large amounts of food, demonstrating food preservation techniques, and encouraging food donations. Agricultural cooperatives and social enterprises can provide knowhow limiting food loss at farms and waste, by transforming unharvested

crops to feed, composting, and preserving food. Importers are encouraged to find alternative destinations for diverse quality of imported foods.

Integrate policies across sectors: Develop holistic policy bundles linking institutions across the agricultural, health, trade, and environmental sustainability domains. Transforming the Jordanian food system is dependent on introducing a set of amendments:

- Policy and technical support to key mechanisms such as the Food Security Council but also Ministry of Planning and International Cooperation
- Reforming regulatory frameworks enabling circular processes, enacting cross-sectoral and measurable strategies
- Organizing dialogue platforms to promote public-private-knowledge partnerships
- Endorsing the creation of the Jordan Agriculture Chamber for communication between decision makers and farmers, supporting capacity building and stimulating cross-sectoral partnerships.
- Designing labour incentives attracting youth into the food system

Make climate resilience a high priority for investment in agriculture, supporting agricultural practices and technologies that build resilience without increasing environmental footprints. Prevent an “efficiency paradox”, which risks using efficiency gains to further push food production rather than environmental considerations. Rather prioritize domestic food security, quality and resource sustainability.

Stimulating multi-sector partnerships between public and private actors for sustainable innovation is central to success. Prompting Jordanian businesses to employ technologies, share knowledge, invest in research and development, and build partnerships can secure collective growth. Co-funding research on emerging sustainable trends such as animal protein substitutes could significantly drop losses and wastage while diversifying nutritional food sources. Building sectoral and cross-sectoral partnerships (farmers and processors) have the potential of converting waste to resource and close gaps in the supply chain. Investing in establishing an organic recycling facility in the port of Aqaba could secure system wide benefits.

Enhance participatory foresight and systems approaches:

Institutionalize participatory modelling and foresight processes across government, not only in food and agriculture through the Higher Food Security Council, but also through key Ministries such as the Ministry of

Planning and International Cooperation. With challenging trends and uncertainties ahead, and data collection only able to reflect the past, it is important to build in embedded capacities to inform key government decision-makers for anticipatory policy.

5.4. Thematic support through policy briefs

In parallel to the foresight process supporting the Higher Food Security Council, the research team of the FoSTr programme has also worked to support specific urgent food systems challenges that were identified during the participatory foresight workshops:

1. Tackling malnutrition in Jordan
2. Water to Food conversion
3. Food loss and waste
4. State of smallholder farming
5. Food governance
6. Role of private sector
7. Role of civil society
8. Whole-sale markets



For each of these themes, interviews and literature review was conducted, and insights and data were presented in a concise and clear manner. Each policy brief offered policy recommendations in line with food systems and foresight perspectives. On ‘Tackling Malnutrition’, a holistic perspective to

understanding how the food system influences individual choices and food environments was highlighted. On 'Water to Food conversion', key practices and crops that use a lot of water were highlighted, pointing to the importance of reframing food loss and waste in terms of water, and highlighting the long-term challenges of producing water-intensive crops for export. The 'Food Governance' paper highlighted the importance of decentralisation processes and knowledge management in order to facilitate food systems change – rather than an overly strong focus on programmes and policies. The 'Whole sale market' brief emphasized the bottlenecks that exist around the centralised fruit and vegetable market system in Jordan, offering various options to enhance the overall functioning of the fresh food market and enhancing the direct linkages between farmers and citizens.

These policy briefs were received well by the Higher Food Security Council and the respective ministries represented there. These briefs have been published in November, after which they can be found online on the Foresight4Food [website](#).



Figure 12: Foresight for Systemic Policy Making workshop

Finally, specific support was provided to the Ministry of Planning and International Cooperation. This was two-fold: we organised a workshop on simulation modelling in November 2024, and in October 2025 Foresight4Food

organised a workshop focused on bringing together representatives of 13 ministries and institutions to learn about foresight and explore how to practice this more actively. The participants together compiled the following key recommendations, which are to be offered to the respective ministers and institutions of all participants

1. **Foresight, scenario building, and systems analysis** are powerful tools for addressing the state of polycrisis, managing uncertainties, and responding effectively to emerging and complex challenges.

تُعدُّ أدوات الاستشراف، وبناء السيناريوهات، وتحليل النظم أدوات قوية لمواجهة حالة الأزمات المتعددة، وإدارة حالات عدم اليقين، والاستجابة بفعالية للتحديات الناشئة والمعقدة

2. **Foresight is not merely about predicting the future**; it is primarily about building preparedness and resilience, mitigating potential risks, and capitalizing on new and evolving opportunities.

لا يقتصر الاستشراف على التنبؤ بالمستقبل فحسب، بل يتمحور أساسًا حول بناء الجاهزية والقدرة على الصمود، والحد من المخاطر المحتملة، واستثمار الفرص الجديدة والناسئة

3. **Transformative processes**, whether at sectoral, national, or regional levels, require a comprehensive understanding of the current situation, analysis of trends, and the formulation of plausible and adaptive future scenarios to guide effective policy and investment decisions.

تتطلب العمليات التحولية، سواء على المستوى القطاعي أو الوطني أو الإقليمي، فهمًا شاملاً للوضع الراهن، وتحليلًا للاتجاهات، وصياغة سيناريوهات مستقبلية واقعية وقابلة للتكيف، لتوجيه القرارات المتعلقة بالسياسات والاستثمارات بشكل فعال

4. It is recommended that **ministries and other public institutions integrate foresight and anticipatory approaches** into their planning, policy formulation, and decision-support processes.

يُوصى بأن تقوم الوزارات والمؤسسات العامة الأخرى بدمج منهجيات الاستشراف والنهج التنبؤية ضمن عمليات تخطيط وصياغة السياسات واتخاذ القرارات

5. National planning authorities or their equivalents should take the lead in identifying and harmonizing **common drivers, assumptions and trends** including demographic change, climate variability, economic growth, trade, employment, and natural resource availability to ensure coherence and alignment across all sectors.

ينبغي لهيئات التخطيط الوطنية أو ما يعادلها أن تضطلع بدور قيادي في تحديد وتنسيق المحركات والعوامل المشتركة والاتجاهات، بما في ذلك التغيير الديمغرافي، وتقلبات المناخ، والنمو الاقتصادي، والتجارة، والتوظيف، وتوافر الموارد الطبيعية، لضمان التناسق والاتساق عبر جميع القطاعات

6. **Governments, development partners, UN agencies, and regional organizations** are encouraged to provide sustained support to strengthen institutional and human capacities for foresight, systems thinking, and evidence-based policymaking. This includes technical assistance, knowledge-sharing platforms, and funding for long-term capacity development.

تُشجّع الحكومات، والشركاء في التنمية، ووكالات الأمم المتحدة، والمنظمات الإقليمية على تقديم دعم مستدام لتعزيز القدرات المؤسسية والبشرية في مجالات الاستشراف، والتفكير النظامي، وصنع السياسات المستندة إلى الأدلة. ويشمل ذلك تقديم المساعدة الفنية، وإنشاء منصات لتبادل المعرفة، وتوفير التمويل لتطوير القدرات على المدى الطويل

7. The participants recommended organizing a **Training of Trainers (ToT) workshop** for participants from Jordan and other Arab countries, with the aim of establishing a pool of qualified trainers and practitioners in the fields of **foresight, scenario building, and policy analysis**.

أوصى المشاركون بتنظيم ورشة تدريب مدربين للمشاركين من الأردن والدول العربية الأخرى، بهدف إنشاء مجموعة من المدربين والممارسين المؤهلين في مجالات الاستشراف، وبناء السيناريوهات، وتحليل السياسات.

8. The workshop emphasized the need for **enhanced national coordination mechanisms** among ministries, research institutions, civil society, and the private sector to ensure that foresight outcomes are effectively integrated into planning frameworks, national strategies, and sectoral policies.

أكدت الورشة على الحاجة إلى تعزيز آليات التنسيق الوطني بين الوزارات، ومؤسسات البحث العلمي، ومنظمات المجتمع المدني، والقطاع الخاص، لضمان دمج مخرجات الاستشراف بفاعلية ضمن أطر التخطيط، والاستراتيجيات الوطنية، والسياسات القطاعية

9. Participants underscored the importance of **regional cooperation and exchange of experiences** among Arab countries to foster mutual learning, share methodologies and best practices, and build a community of foresight practitioners that can collectively address transboundary challenges such as water scarcity, food security, energy, migration, and climate change among others.

شدّد المشاركون على أهمية التعاون الإقليمي وتبادل الخبرات بين الدول العربية لتعزيز التعلم المتبادل، وتبادل المنهجيات وأفضل الممارسات، وبناء مجتمع من ممارسي الاستشراف القادرين على معالجة التحديات العابرة للحدود مثل شح المياه، والأمن الغذائي، والطاقة، والهجرة، وتغير المناخ وغيرها

10. It was further recommended to explore the **establishment of a regional foresight network** to coordinate efforts, harmonize foresight exercises, and facilitate data sharing and policy coherence across the region.

كما تمت التوصية بدراسة إمكانية إنشاء شبكة إقليمية للاستشراف لتنسيق الجهود، وتوحيد التمارين الاستشرافية، وتسهيل تبادل البيانات وضمان الاتساق في السياسات عبر المنطقة

11. **Partnerships with academia and think tanks** should be strengthened to ensure that foresight processes are grounded in robust evidence, supported by research, and continuously updated in light of new data and emerging global trends.

ينبغي تعزيز الشراكات مع المؤسسات الأكاديمية ومراكز الفكر لضمان أن تكون عمليات الاستشراف قائمة على أدلة قوية، ومدعومة بالبحث العلمي، ومحدّثة باستمرار في ضوء البيانات الجديدة والاتجاهات العالمية الناشئة

6. Reflections and way forward

6.1 Reflections

To reflect on the progress of our work, a mid-term and final reflection report were developed. Here, key stakeholders involved in the FoSTr work in Jordan were consulted through interviews, surveys and focus groups. From these consultations, stakeholders reflected that they were positive about the strategic value of foresight, which particularly helps to overcome short-term focus with long-term thinking. The fact that the process was evidence-based was important, as Jordan government and researchers found it important to have clear data to base decisions on. The food systems stakeholders approved of the workshops to engage in dialogue and build a shared understanding of the food system of Jordan. It was pointed out that we have delivered a lot with limited resources, and have built trust among key stakeholders. Some pointed to the need for better and more investment in capacities and application: awareness and skills need to be further developed and foresight needs to be applied in various specific domains and governorates. It was seen that foresight and food systems thinking is important, but more attention needs to go to multi-stakeholder partnership processes to tackle the lack of engagement between business, government, research and civil society. Finally, some concerns were raised that the foresight process was yet to translate into concrete policies and that it was not immediately clear how local beneficiaries such as smallholder farmers might directly benefit from this work.

With its research team and collaborations with government agencies, FoSTr helped build national capacity for foresight. Stakeholders reported that the process improved their understanding of other actors' perspectives, clarified roles, encouraged systems thinking, and provided structured spaces for dialogue, fostering trust and collaboration across the food system. Finally, FoSTr highlighted the consequences of inaction on important food system challenges, such as climate change, and promoted strategic thinking about alternative futures.

In summary, key areas that FoSTr Jordan was strong at were:

- Cultivating national leadership and ownership of the transformation process

- Showing that the process is as important as the results
- Active participation of stakeholders
- Introducing consensus building and decision aiding tools
- Clear delineation of tasks and responsibilities across partners
- Building transparency and access to trusted data and information
- Creating a shared awareness of issues related to food security from a food systems perspective especially among decision makers, producers and consumers
- Highlighting the importance of food loss and waste, which is not given the attention it deserves in Jordan
- Collaborating across scales: going to the governorates Tafila, Karak and Irbid but also cooperation with neighbouring Arab countries
- Creating the urgency among key institutions such as MOPIC for the need to establish national future trend and uncertainty monitoring of relevant indicators such as population, availability of water, conflicts and supply chain dynamics
- Disseminating foresight as an effective tool for transforming other sectors in Jordan and the region.
- Creating a foresight group in Jordan with potential national and sectoral championships for food and other sectors transformation.

6.2 Way forward

The reflection process also highlighted opportunities for follow-up and lessons to inform future foresight initiatives. Broadening the range of actors, including grassroots communities, governorates, youth, women, and the private sector, was seen as an opportunity to increase relevance and inclusivity. Strengthening relationships with government partners was identified as important for fostering ownership and demand for foresight. Finally, future phases could benefit from a deeper partnership with NAJMAH, JOHUD and AOAD as key organisations with a strong network across different food systems domains in Jordan. Stakeholders suggested to focus on making foresight the standard approach across government ministries guided by MOPIC and Higher Food Security Council. Furthermore, a stronger network of foresight-trained facilitators and champions of change should be cultivated. Finally, leverage points and key intervention packages need to be further outlined and implemented.



The Foresight for Food System Transformation (FoSTr) is a programme that supports policymakers and other key stakeholders in the food system with scenarios and foresight analysis about the food system of the future. The programme is financed by the Kingdom of the Netherlands, overseen by IFAD and implemented by the University of Oxford's Environmental Change Institute, Wageningen University & Research and key partners in the international [Foresight4Food network](#).