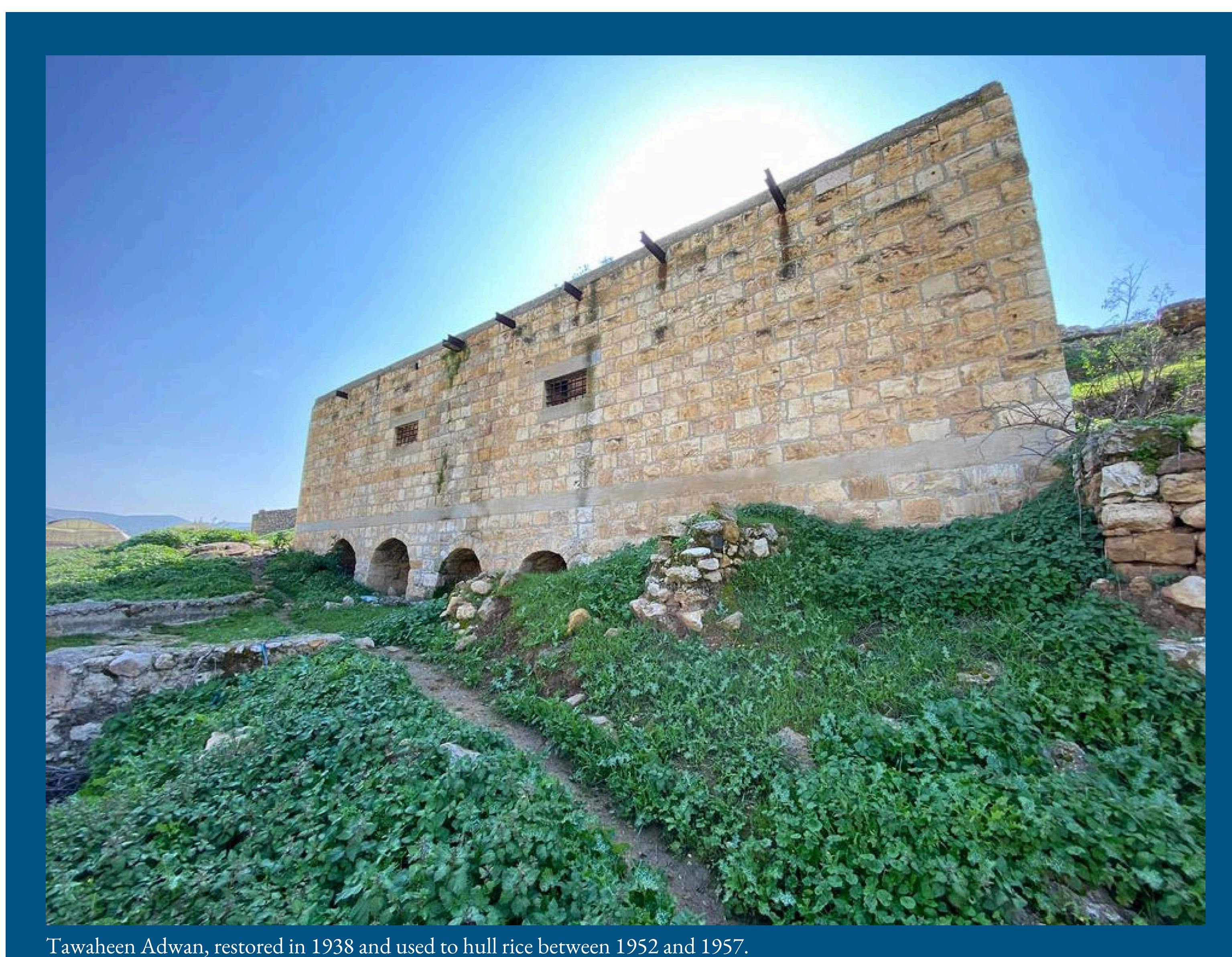


# From Managing Scarcity to Building Resilience: A Diagnostic Study of Jordan's Agriculture and Food System

*A systemic assessment of vulnerability and resilience in support of the Economic Modernisation Vision 2022–2033*



Tawaheen Adwan, restored in 1938 and used to hull rice between 1952 and 1957.

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# Index

| #        | Title                                                     | Page      |
|----------|-----------------------------------------------------------|-----------|
|          | Executive Summary                                         | 5         |
| <b>1</b> | <b>Introduction to the Study</b>                          | <b>7</b>  |
| 1.1      | Background and context                                    | 7         |
| 1.2      | The research problem and its questions                    | 8         |
| 1.3      | Study objectives                                          | 8         |
| 1.4      | Significance and rationale                                | 8         |
| 1.5      | Scope and limitations                                     | 9         |
| <b>2</b> | <b>Conceptual and Methodological Framework</b>            | <b>10</b> |
| 2.1      | From food security to systemic resilience                 | 10        |
| 2.2      | The working definition adopted                            | 10        |
| 2.3      | The five dimensions of resilience                         | 10        |
| 2.4      | The four thematic areas and vulnerability classification  | 11        |
| 2.5      | The systems approach, data sources, and their limitations | 12        |
| 2.6      | Alignment with the Economic Modernisation Vision          | 12        |
| <b>3</b> | <b>The Diagnosis: Context and Vulnerability Map</b>       | <b>13</b> |
| 3.1      | 3.1 The general context of the system                     | 13        |
| 3.2      | The natural resources area                                | 13        |
| 3.3      | The trade and imports area                                | 17        |
| 3.4      | The production area                                       | 19        |



# Index

| #        | Title                                                                            | Page      |
|----------|----------------------------------------------------------------------------------|-----------|
| 3.5      | Agri-food industries and import substitution                                     | 21        |
| 3.6      | The governance area                                                              | 22        |
| 3.7      | Sub-sectoral analysis                                                            | 25        |
| 3.8      | Summary of vulnerability classification across the thematic areas                | 27        |
| <b>4</b> | <b>Systemic Analysis: How the System Moves Under Pressure</b>                    | <b>29</b> |
| 4.1      | Shock transmission pathways                                                      | 29        |
| 4.2      | A closer reading into the shocks since 2020                                      | 31        |
| 4.3      | Purchasing power and social resilience: the household dimension of food security | 32        |
| 4.4      | The core trade-offs                                                              | 33        |
| 4.5      | Forward-looking analysis: the concurrence scenario                               | 34        |
| <b>5</b> | <b>Conclusions</b>                                                               | <b>35</b> |
| <b>6</b> | <b>Recommendations and Priority Directions</b>                                   | <b>36</b> |
| 6.1      | Integrating water, energy, and agriculture decisions                             | 36        |
| 6.2      | Institutionalising food security and launching a national indicator              | 37        |
| 6.3      | Converting the reserve into a logistical resilience standard                     | 37        |
| 6.4      | Unifying the food purchasing power system                                        | 38        |
| 6.5      | Focusing on high-value products and import substitution opportunities            | 38        |
| 6.6      | Building farmers' capacities in irrigation efficiency and modern technologies    | 38        |
| 6.7      | Fortifying the water-energy pathway against geopolitical shocks                  | 39        |



# Index

| #        | Title                                    | Page       |
|----------|------------------------------------------|------------|
| 6 . 8    | The accompanying applied research agenda | 3 9        |
| <b>7</b> | <b>Conclusion</b>                        | <b>4 1</b> |
| <b>8</b> | <b>References</b>                        | <b>4 2</b> |
|          | About                                    | 4 4        |



# Executive Summary

This study is framed by a paradox that captures the condition of Jordan's agriculture and food system: Jordan has maintained a stable food supply through successive shocks, without significant consumer-facing shortages, despite being unable to produce all of its own food or achieve self-sufficiency under prevailing structural conditions and constraints.

Two deep-rooted structural determinants shape the system. The first is acute water scarcity; the per capita share of renewable water does not exceed around 61 cubic metres a year, among the lowest levels in the world.<sup>(1)</sup> The second is structural dependence on imports; Jordan imports around 97% of its cereals and 100% of its sugar and rice, along with most of its vegetable oils, red meat, and animal feed. This exposure reflects the system's underlying structure, rather than a failure of management.

The three factors that produced this stability, namely high commodity reserves, donor support mobilised in response to periods of need, and government budget allocations for subsidies, have all come under mounting pressure since 2020: first the COVID-19 pandemic, then the Russo-Ukrainian War, then the Bab-el-Mandeb and Red Sea shipping crisis, and most recently the regional and international conflicts accompanied by the closure of the Strait of Hormuz in 2026. This leads to the study's central question: for how long can these conditions be expected to hold in the years ahead?

This study reframes the food question in Jordan accordingly. The focus should not be the pursuit of an out-of-reach self-sufficiency made limited by resources. The focus should be on the construction of a resilient system able to absorb shocks without breaking and to recover without deepening social or fiscal pressures, adaptable to a future of growing volatility in water, climate, geopolitics, and donor budgets. Resilience in this sense is the necessary condition for food security under resource scarcity, and the study measures it across its five established dimensions: **Robustness (the capacity of systems to withstand shocks)**, **Redundancy (the existence of backup systems and spare capacity)**, **Resourcefulness (the capacity of systems to mobilise resources)**, **Responsiveness (response)**, and **Recovery**.

The diagnosis rests on a framework that illustrates vulnerability across four thematic areas: natural resources, trade and imports, production, and governance. The study concludes that water, together with energy, is the binding constraint; around 41% of the water supply is lost before it reaches the consumer, as recoverable physical and commercial losses. The Aqaba–Amman water desalination and conveyance project marks a shift in supply,<sup>(2)</sup> yet it transfers part of the exposure from water to energy.<sup>(3)</sup> Imports are both the system's main stabiliser and its largest source of risk. Production emerges as a gateway to opportunity through high-value products rather than an instrument of self-sufficiency, while governance continues to depend on strengthening effective interministerial coordination.

1 Ministry of Water and Irrigation (2023), National Water Strategy 2023–2040; and Food and Agriculture Organization, AQUASTAT (2020).

2 Ministry of Water and Irrigation and the National Water Carrier Project Company (2025), Aqaba–Amman Project Agreement (January 2025).

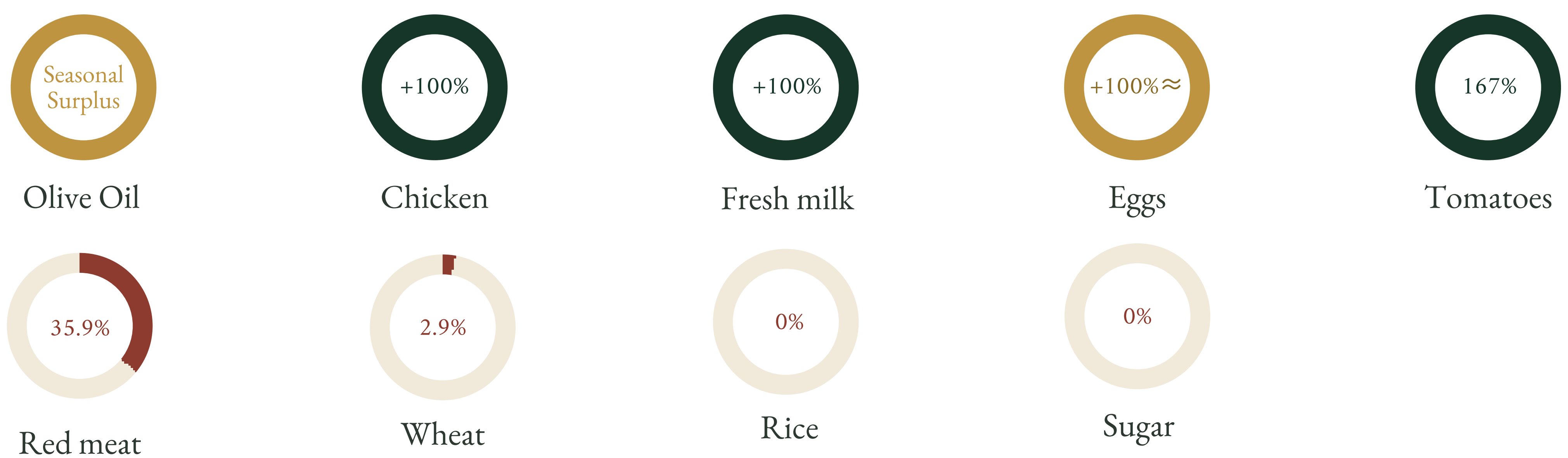
3 US Energy Information Administration (EIA) and International Energy Agency (IEA) (2025), the Strait of Hormuz as a global oil chokepoint; and Regional Energy Market Reports (2026) on the interruption of gas supplied from the Leviathan gas field.



These areas function as a single system, in which a shock in one is transmitted to the others. Two recent episodes illustrate this dynamic: the Bab-el-Mandeb and Red Sea shipping crisis generated logistical disruption at Aqaba and increased import costs; more recently, regional and international conflicts, the closure of the Strait of Hormuz, a global rise in oil prices, and interruptions to gas supplies from the Leviathan gas field affected a source that supplies around 60% of electricity generation. The industrial-sector review indicates that food industries are a major source of value added, comprising around 2,600 establishments, production worth approximately JD 4.5 billion, and exports of JD 926 million to 114 countries in 2025. It also identifies substantial import gaps that may offer opportunities for competitive import substitution and domestic investment.

From this analysis emerge eight priority directions for decision-makers, ranked by their expected contribution to resilience rather than by sector: integrating water, energy, and agriculture decisions, beginning with the pricing of the Aqaba–Amman project and the linking of pumping times to surplus energy; deepening the institutionalisation of food security and launching a national indicator for it; upgrading the strategic reserve from a quantitative coverage measure to a logistical resilience standard; unifying the instruments of food purchasing power within a single targeting system; expanding high-value production and export-orientated import substitution; building farmers' capacities in irrigation efficiency and modern technologies; fortifying the water-energy pathway against geopolitical shocks; and an accompanying applied research agenda. These directions also align with the two pillars of the Economic Modernisation Vision 2022–2033: quality of life founded on stable and affordable food and sustainable growth founded on converting agri-food knowledge into exports and jobs.

#### Self-sufficiency per products:



Average self-sufficiency (by weight) 2024: 61.4% - compared by 2020: 57.3%

Fig. 1: Percentages of self-sufficiency according to product.

#### ◆ The core message

- Jordan is not short of food; the country is managing a structural exposure with a costly success, resting on conditions that come under greater pressure by the day.
- What is required is a transition from managing shocks through improvised mobilisation (*al-fazaa*) to building resilience through an integrated, proactive decision that aligns quality of life with sustainable growth.



# 1. Introduction to the Study

## 1.1 Background and context:

Jordan offers one of the clearest cases in the region of a country that has stabilised its food supply despite structural constraints on domestic food production. The per capita share of water stands at around 61 cubic metres a year according to the latest estimate from the Ministry of Water and Irrigation, a figure lower than the AQUASTAT estimate (under 100 cubic metres, 2020) and one that reflects accelerating deterioration, with a projected decline to around 46 cubic metres by 2040.<sup>(4)</sup> Agricultural land amounts to around 2.01 million dunums, only a quarter of which is irrigated, while wheat, the commodity carrying the greatest cultural and political weight, is imported at a rate approaching 97%, and the strategic wheat stock is managed at levels approaching ten months, combining physical stock with contracted shipments for consumption.<sup>(5) (6)</sup>

The food balance sheet shows that the self-sufficiency ratio for food commodities reached 61.4% in 2024, compared with 57.3% in 2020, a figure that requires careful interpretation. The ratio is calculated by tonnage, that is, by dividing domestic production by the quantity available for consumption, and it therefore favours the heavy commodities in which Jordan excels and which it exports: vegetables, tomatoes, table eggs, fresh milk, and olive oil. By contrast, the staples that underpin daily consumption are largely import-dependent; wheat production stands at around 2.9% and covers only a single week of requirements. Jordan imports 100% of its rice and sugar, as well as most of its vegetable oils, and it produces 35.9% of its red meat. To this must be added the fact that part of this self-sufficiency is self-sufficiency in the final product rather than the inputs, since poultry and dairy production depend heavily on imported feed. The conclusion is that the high figure measures Jordan's capacity to produce foods with export value rather than its capacity to feed its population from its own production, and it is precisely this distinction that leads the study to prefer the lens of resilience over the lens of self-sufficiency.<sup>(7)</sup>

The paradox is that this exposure has not produced any disruption in supply. No shortage of goods or commodities has emerged despite a succession of shocks since 2020, a significant achievement in a region where food crises have ignited major political unrest. However, the conditions underpinning this outcome cannot be assumed to persist. Each has been tested in recent years, warranting a systemic assessment of the sources and limits of Jordan's resilience.

Among the important historical examples of decisions taken to strengthen the resilience of the agriculture and food system is the establishment of the Faisal Agricultural Nursery in Jerash Governorate in 1963, by decision of the then Prime Minister Wasfi al-Tal, on an area of around 500 dunums. It became the Ministry of Agriculture's largest nursery for producing fruit trees. Its strategic significance lies in the fact that the decision to establish it was not a response to an immediate crisis: it reflected a strategic assessment of the regional environment, aimed at producing seedlings within the East Bank and reducing dependence on the Khadouri Nursery in the West Bank. This foresight proved its worth when the nursery preserved national productive capacity after the events of 1967, which cut off access to earlier seedling sources.<sup>(8)</sup>

(4) Jordan Chamber of Industry (2025), Figures for the Food Industries Sector and Exports 2025.

(5) Ministry of Water and Irrigation (2023), National Water Strategy 2023–2040; and Food and Agriculture Organization, AQUASTAT (2020).

(6) Ministry of Industry, Trade and Supply (2025–2026), Strategic Reserve Figures and the Wheat and Barley Purchase Plan 2026; and Al Ghad newspaper (19 January 2026), around 900,000 tonnes of wheat stored and contracted, giving ten months of coverage at a monthly consumption of 90,000 tonnes, and 640,000 tonnes of barley giving eight months of coverage.

(7) Department of Statistics (2026), Annual Food Balance Sheet Bulletin for 2024. Prepared according to the methodology of the Food and Agriculture Organization (FAO); the self-sufficiency ratio is calculated by dividing the quantity of domestic production by the total quantity available for consumption (production + imports – exports), and it does not include feed commodities.

(8) Ministry of Agriculture and Jordan News Agency (Petra) (2024), The Faisal Agricultural Nursery in Jerash.



The nursery today uses water-saving technologies with international support, thereby linking the lessons of the past to the current water efficiency agenda. The methodological conclusion on which this study rests is that food security begins with small, long-range decisions taken in times of plenty rather than in times of crisis, and that resilience is a property built proactively before a shock, not during it, within an integrated systemic vision that connects the present's decisions to the future's exposure.

## 1.2 The research problem and its questions:

The study proceeds from a central problem: Jordan's agriculture and food system has so far succeeded in managing its structural exposure, but the sources of that success are scattered, have not been read systemically as a whole, and have not been tested against simultaneous or protracted shocks. The research problem is therefore one of diagnosing the system's resilience rather than measuring the current level of food security: identifying where the most consequential vulnerabilities of the system's resilience lie, how they interact, and which leverage points offer the highest return on its capacity to withstand shocks, moving beyond an unrealistic narrative of self-sufficiency. The study addresses five questions, which structure the chapters and are brought together in the final analysis and conclusions:

- Which structural characteristics weigh most heavily on the system's vulnerability across its four thematic areas: natural resources, trade and imports, production, and governance?
- How do these areas interact, and along which pathways are shocks transmitted from one area to another?
- What are the system's current resilience characteristics across its five dimensions, and where do its strengths and weaknesses lie?
- Which leverage points offer the highest expected return on resilience, and how do they align with the Economic Modernisation Vision?
- What lessons do recent shocks reveal about the behaviour of the system under pressure?

## 1.3 Study objectives

The study aims to provide a systemic view of the most consequential points of exposure in the agriculture and food system and of how they interact; to illustrate the pathways along which shocks and imbalances are transmitted between the thematic areas; to identify the policy and investment leverage points with the highest expected return on resilience; and to set out a preliminary research agenda that converts the diagnosis into specific reform options. The study does not set out to propose detailed reforms so much as to define the strategic terrain on which subsequent policy work should concentrate.

## 1.4 Significance and rationale

The significance of the study lies in shifting the debate from how much food Jordan produces domestically to how the system can remain resilient across shocks. This creates an analytical shift suited to a reality of permanent scarcity and one that avoids the illusions of self-sufficiency, which are costly in both water and money. Its significance also derives from its direct alignment with the Economic Modernisation Vision 2022–2033, which places agriculture and food security among the priority growth sectors and links stable food to household welfare in a country where more than a quarter of household spending goes on food (around 27% of the consumer basket). Strengthening the resilience of the system is therefore a growth strategy and a quality-of-life strategy at the same time. The study is addressed to the relevant decision-making bodies: the relevant ministries, policy delivery units, research centres, and the international partners funding the agriculture and food agenda.



## 1.5 Scope and limitations

The study is by design a strategic diagnostic study. It addresses the agriculture and food system at national level over a time horizon extending to 2040, with an analytical focus on the period 2020–2026. It covers the four thematic areas and their interconnections without claiming comprehensive coverage of every sub-value chain. It also consolidates data scattered across ministry portals, donor reports, and academic journals, drawing on the most recent sources available and drawing attention to older data sources where they remain valid reference points.

### ◆ Introduction summary

- *The problem lies in the system's resilience against simultaneous or protracted shocks rather than in the current level of food security.*
- *Resilience is built proactively, as the precedent of the Faisal Nursery shows: a small, long-range decision taken in a time of ease protects the system in a time of crisis.*



# 2. Conceptual and Methodological Framework

## 2.1 From food security to systemic resilience

The food question in Jordan is a question of systemic resilience rather than one of self-sufficiency or of food security in its narrower conventional sense. The traditional four-pillar framework (availability, access, utilisation, and stability) captures the picture at a given moment but does not describe the dynamics of the system under pressure. Given Jordan's structural determinants, the more apt operational question is not whether food is available today, but how the availability of food will respond to the next shock. Resilience is the framework that answers that question.

## 2.2 The working definition adopted

The study builds a composite operational definition drawing on seminal sources: the Food and Agriculture Organization (FAO)'s definition of the High Level Panel of Experts on Food Security and Nutrition (HLPE), which identifies the system's central function as providing food security for all under all circumstances and distinguishes transient shocks from sustained stresses; the definition of the Organisation for Economic Co-operation and Development (OECD), which adds the capacities of absorption, recovery, adaptation, and transformation; and Tendall's definition, which frames resilience as a property of food system behaviour over time and across multiple levels. These are grounded in the National Food Security Strategy and in the World Bank's Country Climate and Development Report.

Accordingly, the resilience of Jordan's agriculture and food system may be defined as:

*“The capacity of the system, under permanent water scarcity and structural dependence on importation, to absorb shocks to supply and price, to adapt as its composition changes when shocks reveal new conditions, and to transform structurally when existing configurations cease to be viable. It is a property of the system's behaviour over time, not synonymous with stability or self-sufficiency.”*

It follows from this definition that resilience operates at multiple functional levels (supply, price, and access), across multiple scales (household, value chain, and national level), and over multiple time horizons. Short-term absorption requires reserves and substitutability; medium-term adaptation requires investment, institutional learning, and a trade strategy; and long-term transformation requires structural choices concerning water, land, and the composition of a high-value agri-food sector.

## 2.3 The five dimensions of resilience

To put this definition into practice, the study adopts the established dimensions of the resilience framework as developed in the resilience engineering literature: Robustness (the capacity of systems to withstand shocks), Redundancy (the existence of backup systems and spare capacity) and Resourcefulness (the capacity of systems to mobilise resources). The temporal dimension has been adapted to the Jordanian context by separating it into two functionally distinct dimensions,



Responsiveness (response) and Recovery, given that recovery in the Jordanian system is primarily financial and institutional, encompassing the replenishment of reserves, the rebuilding of subsidies, and the negotiation of grants and loans. The table below gives a brief account of each of the five dimensions:

| Dimension                                                                 | Reading                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Robustness</b><br>(the capacity of systems to withstand shocks)        | Withstanding a shock without functional disruption, evident in the strategic wheat reserves, the diversification of water supplies, and the soundness of the wheat flour subsidy system.                                                           |
| <b>Redundancy</b><br>(the existence of backup systems and spare capacity) | The existence of suppliers, supply routes, and functional alternatives, through diversified import sources, shipping alternatives, distributed storage, and crop substitutability.                                                                 |
| <b>Resourcefulness</b><br>(the capacity of systems to mobilise resources) | Mobilising financial, technical, and regulatory resources under pressure: access to the International Monetary Fund (IMF)'s easing measures and donor coordination alongside action by the ministries concerned.                                   |
| <b>Responsiveness</b>                                                     | The speed and coherence of action once a shock has been detected, linked to the Higher Council for Food Security, its information system, and inter-ministerial coordination protocols.                                                            |
| <b>Recovery</b>                                                           | Restoring function and rebuilding it in a better-adapted form, coupled with institutional learning. In Jordan, this is primarily financial and institutional, and it has been adapted to reflect the particular character of local recovery costs. |

**Table 1: The five dimensions of resilience and their reading in the Jordanian case**

These five dimensions intersect with the absorptive, adaptive, and transformative capacities established in the resilience literature. Robustness (the capacity of systems to withstand shocks) and Redundancy (the existence of backup systems and spare capacity) serve the capacity to absorb a shock; Resourcefulness (the capacity of systems to mobilise resources) and Responsiveness (response) serve adaptive capacity; and Recovery serves both adaptive and transformative capacity through learning and rebuilding. This ensures that the operational framework remains consistent with its conceptual grounding.

## 2.4 The four thematic areas and vulnerability classification

The diagnosis is structured around four thematic areas which together cover the principal sources of vulnerability and correspond to existing institutional responsibilities: natural resources (water, climate, land and their interconnection with energy); trade and import dependence (imports, shipping, ports and reserves); production (agriculture, livestock, manufacturing and high-value products); and governance (coordination, implementation, social protection and data). The analysis of each area concludes with the application of the vulnerability classification matrix, which combines severity of impact with the likelihood of exposure to, or disruption by, a given hazard, using the indicative categories high, medium, and low so that the assessment can be compared and ranked. Under this rule, vulnerability is classified as high where both impact and likelihood are high; medium where a high impact is combined with a medium likelihood, or a medium impact with a high likelihood; and low where the likelihood of being affected is low, however high the impact, because sufficient institutional barriers exist, or where both dimensions are medium or below.



## 2.5 The systems approach, data sources and their limitations

The study adopts a systems-analysis approach that transcends the isolated examination of individual sectors in order to illustrate the pathways of interconnection and overlap between them and to identify high-leverage intervention points through which modest interventions can deliver broad gains for the resilience of the system as a whole. The methodology draws on a comprehensive review of national strategies, ministerial data, reports by international organisations and statistics from the Jordan Chamber of Industry and the Jordan Chamber of Commerce, alongside the relevant academic literature. The study also included fieldwork comprising site visits and expert interviews to enrich the analysis. Several experts requested anonymity; their identities have therefore been kept confidential, while observations from field visits have been documented and attributed where appropriate.

Three methodological limitations should be noted. First, some core figures, such as the 2020 livestock census and the 2004 greenhouse survey, date from earlier periods and may not accurately reflect current productive capacity. Second, household expenditure data are older than what would be considered analytically optimal, since the 2017/2018 survey remains the most recent nationally approved reference dataset. Third, parts of the sector, such as migrant labour and informal water uses, still lack adequate monitoring and documentation. These challenges point to knowledge gaps, which have been converted into research priorities and included in the final recommendations.

## 2.6 Alignment with the Economic Modernisation Vision

Resilience, framed in this way, aligns directly with the two pillars of the Economic Modernisation Vision. Under the growth pillar, the Vision identifies high-value industries as a principal driver of growth, and the agriculture and food security sector falls within them. Under the quality-of-life pillar, stable and affordable food is among the most direct determinants of household welfare. The Vision's first executive programme selected 183 initiatives out of 380, nine of which, worth around 66 million Jordanian dinars, fall within the agriculture and food security sector. The sector grew by 6.8% in the first quarter of 2026, leading growth among all economic activities, and agricultural exports reached around 1.526 billion dinars in 2024, an increase of 39% compared with 2023. The issue, therefore, is not whether to invest in resilience, but how to do so in a manner that reinforces both resilience and growth.

### ◆ Conceptual Framework Summary

- *Resilience is the capacity of the system to absorb, adapt, and transform under conditions of permanent scarcity. It is assessed across five dimensions: Robustness, Redundancy, Resourcefulness, Responsiveness, and Recovery.*
- *The framework aligns with the two pillars of the Economic Modernisation Vision: quality of life and sustainable growth, considered together.*



# 3. The Diagnosis: Context and Vulnerability Map

This chapter assesses the system across the four thematic areas. Each area is approached in the same manner: an overview of the current situation, then an extended analysis of the principal vulnerabilities, then a reading of resilience characteristics across the five dimensions, followed by a reasoned classification of vulnerability in terms of impact and likelihood. The chapter is then completed with a sub-sectoral analysis, a section devoted to food industries and import substitution, and a comparative summary.

## 3.1 The general context of the system

Jordan's agriculture and food system is defined by three interacting conditions: a scarce natural resource base, extensive trade dependence, and an established governance structure that exists institutionally, yet remains incomplete at the level of practical implementation and coordination. The agricultural economy contributed 6.1% of gross domestic product in the first quarter of 2026, the highest share on record, having achieved the highest growth rate of any economic activity at 6.8% at constant prices, while the food import bill stands at around 4.6 billion US dollars, or around 20% of imported goods. It is this combination of a sector small in its contribution yet high in social sensitivity and of extensive external dependence that is nonetheless efficiently managed that makes reading the system through the lens of resilience more useful than reading it through the lens of self-sufficiency.<sup>(9)</sup>

A demographic and social dimension further amplifies the system's sensitivity to external shocks. Jordan hosts approximately 1.3 million Syrians, in addition to earlier waves of refugees, increasing demand for subsidised food and public services while imposing a structural fiscal burden that interacts with and compounds the effects of external shocks. The high share of food expenditure in the budgets of low-income households also means that sudden increases in food prices pose a challenge to social stability, rather than merely affecting economic welfare. This helps explain why the state regards the stability of bread prices as a sovereign priority rather than simply a sectoral policy concern.

## 3.2 The natural resources area

### Current situation

The latest water balance records total available water at around 1,127 million cubic metres (58% groundwater, 26% surface water and 16% treated wastewater), with demand distributed between agriculture and municipal supply and industry taking the small remainder. The water deficit is set to widen steadily towards 2040, particularly in the absence of new sources. Water in Jordan is shaped by three structural conditions: conventional renewable resources cover only two-thirds of consumption; around 41% of municipal supply is lost before reaching the consumer as non-revenue water (NRW), divided into physical losses (leakage from ageing networks, which is the larger share) and commercial losses (illegal connections and metering and

(9) Ministry of Agriculture and Jordan News Agency (Petra) (2026), statement by the Minister of Agriculture on the performance of the agricultural sector in the first quarter of 2026, based on Department of Statistics data.



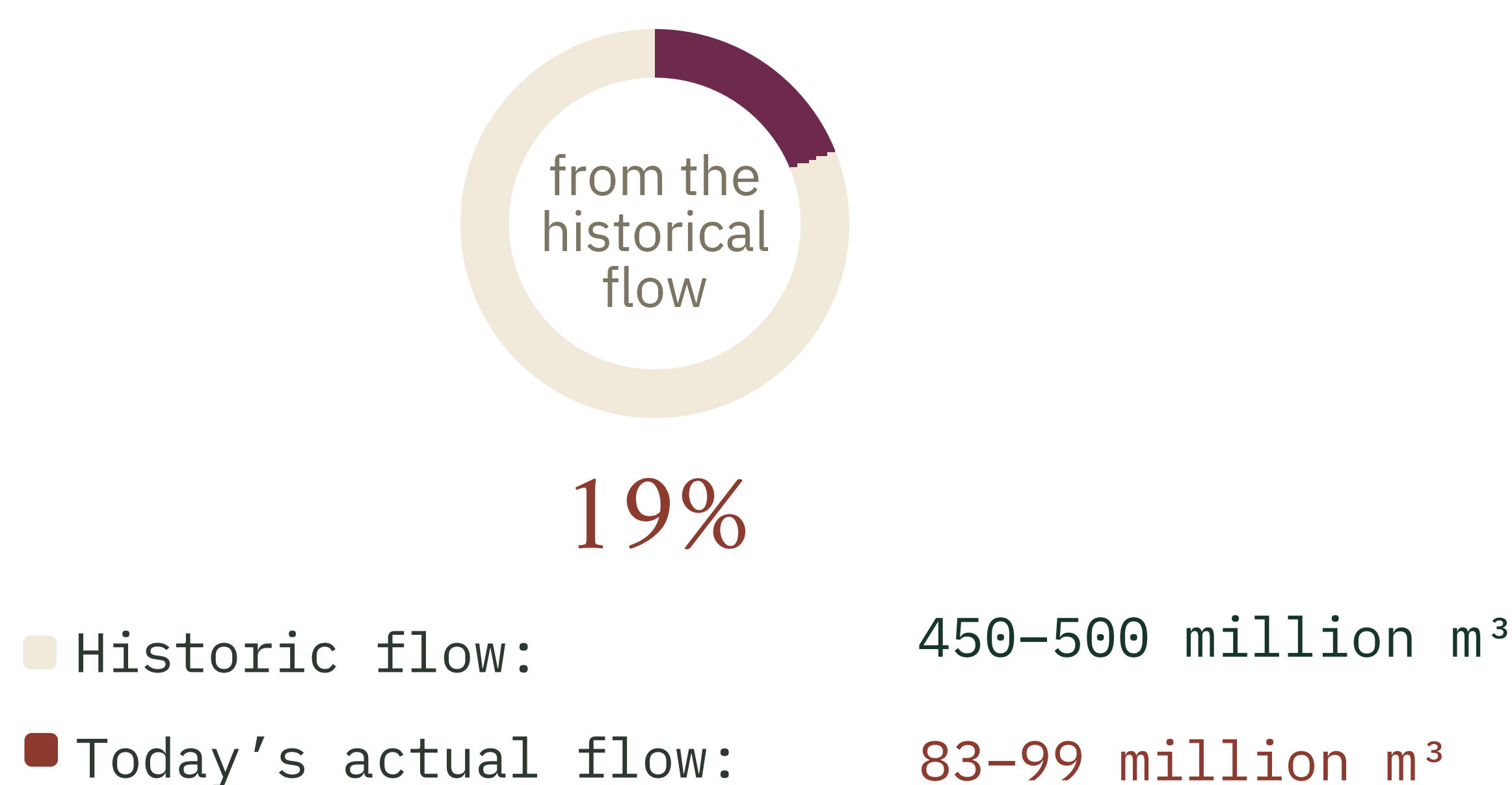
and billing errors); and around 75% of the twelve aquifers are subject to overextraction, while the Yarmouk today delivers only 83 to 99 million cubic metres against a historical flow of 450 to 500 million. Climate change compounds these pressures, with rainfall projected to decline by between 3 and 17 mm a year by 2050, an effect seen in the 2024–2025 season, considered one of the weakest in decades.

An assessment of water scarcity must consider more than rainfall and aquifers; a significant share of Jordan's water supply originates beyond its borders and is subject to political decisions rather than climatic cycles. Jordan is the lower riparian in two basins at once. Under the 1994 peace treaty, the Israeli side receives a fixed share of Yarmouk water estimated at around 25 million cubic metres a year, which it receives in full on a regular basis, while only a variable portion of Jordan's contractual share reaches it. The same treaty obliges the Israeli authorities to supply Jordan with fifty million cubic metres a year from the Jordan River, a quantity that continues to be supplied under the treaty. The supplementary agreement signed in 2021, which allowed the purchase of a further fifty million cubic metres at reduced prices, expired at the end of 2025; the Israeli authorities declined to renew the agreement, making renewal conditional on the state of bilateral relations rather than water needs, and declaring that it is under no legal obligation to supply these quantities, effectively transforming access to a vital resource into a tool of political bargaining.<sup>(10)</sup>

To the north, the Yarmouk River water investment agreement signed with Syria in 1987 provides for a Jordanian share of around 200 million cubic metres a year and specifies a ceiling on the number of dams. Exceeding that ceiling, together with the drilling of thousands of wells in the basin, reduced the actual inflow to tens of millions. The Unity Dam (Wehda Dam), whose full cost Jordan bore, was consequently redesigned to around half its planned storage capacity. The structural flaw lies in the agreement itself, which addressed surface water but not groundwater, the channel through which the greatest depletion has occurred. Recent political developments have nonetheless opened the first negotiating window in decades, with the resumption of the work of the Joint Technical Committee at the Unity Dam.<sup>(11)</sup>

In sum, Jordan's share of these waters is primarily determined by politics rather than by natural factors, and neither agreement possesses an enforceable arbitration mechanism. This vulnerability cannot be addressed through technology alone; it must be treated as a sovereign issue rather than a service-sector matter and addressed through diplomacy, negotiation, and international legal mechanisms alongside technical investment.

### Less than one-fifth of the Yarmouk River's historical flow currently reaches Jordan.



The discrepancy is attributable to the number of wells exceeding the limit agreed upon in the 1987 agreement with Syria, rather than being caused solely by reduced rainfall.

Figure 2: Historical Water Flow Contributions from the Yarmouk River

(10) Madar Research Centre (2025), "A Neighbourhood Dry of Water: How Is Israeli Abundance Managed Against Jordanian Scarcity?"; Euronews Arabic (July 2026), report on the non-renewal of the agreement to purchase additional water.

(11) Yarmouk River Water Investment Agreement between Jordan and Syria (1987); Ministry of Water and Irrigation, data on Yarmouk flows and the capacity of the Unity Dam; and the statement of the Joint Jordanian–Syrian Technical Committee (2025) on mechanisms for distributing the basin's water.



## The water-energy interconnection

An assessment of water must account for the energy dimension. Desalination and pumping in the Aqaba–Amman National Water Carrier project are energy-intensive, and Jordan imports most of its energy, so desalination transfers part of the exposure from water to energy. This coupling was confirmed by the Ministry of Water and Irrigation when it attributed part of the project’s increased cost to desalination and energy requirements. The recent regional and international conflicts exposed the fragility of this foundation, as gas supplied from the Leviathan gas field, which feeds around 60% of electricity generation, was interrupted twice (during the Twelve-Day War in June 2025, and then in a stoppage lasting around a month at the start of 2026, the longest since exports began). The National Electric Power Company was obliged to adopt an emergency plan that included halting gas supplies to industry and switching to liquefied natural gas and diesel for electricity generation. The Energy and Minerals Regulatory Commission estimated that generation costs rose by around 100 million Jordanian dinars per month at the height of the crisis. This coincided with the closure of the Strait of Hormuz, through which around 20 million barrels a day pass, and with Brent crude rising above 110 US dollars a barrel. This sequence shows how an energy shock raises electricity costs, which in turn increase the cost of water pumping, desalination, and food production.<sup>(12)</sup>

Policy is turning towards domestic sources. Production from the Risha gas field has risen from around 17 to between 80 and 90 million cubic feet a day, and the Energy Sector Strategy 2025–2035 targets around 418 million by 2029, which could cover more than 60% of national requirements by 2030. Storage is a critical issue in renewable energy. Installed capacity stands at around 6,000 megawatts against an average load of between 2,000 and 2,500, and the National Electric Power Company paid around 380 million dinars for unused energy under capacity clauses, alongside losses approaching 410 million dinars in 2023. This analysis points to three priorities: long-term planning, expanded battery storage, and time-of-use tariffs. One potentially high-impact integration measure is to link National Water Carrier pumping to periods of surplus energy while the project is still under construction.

### A Massive Untapped Electricity Surplus... While Energy Crises Are Managed with Diesel and LNG

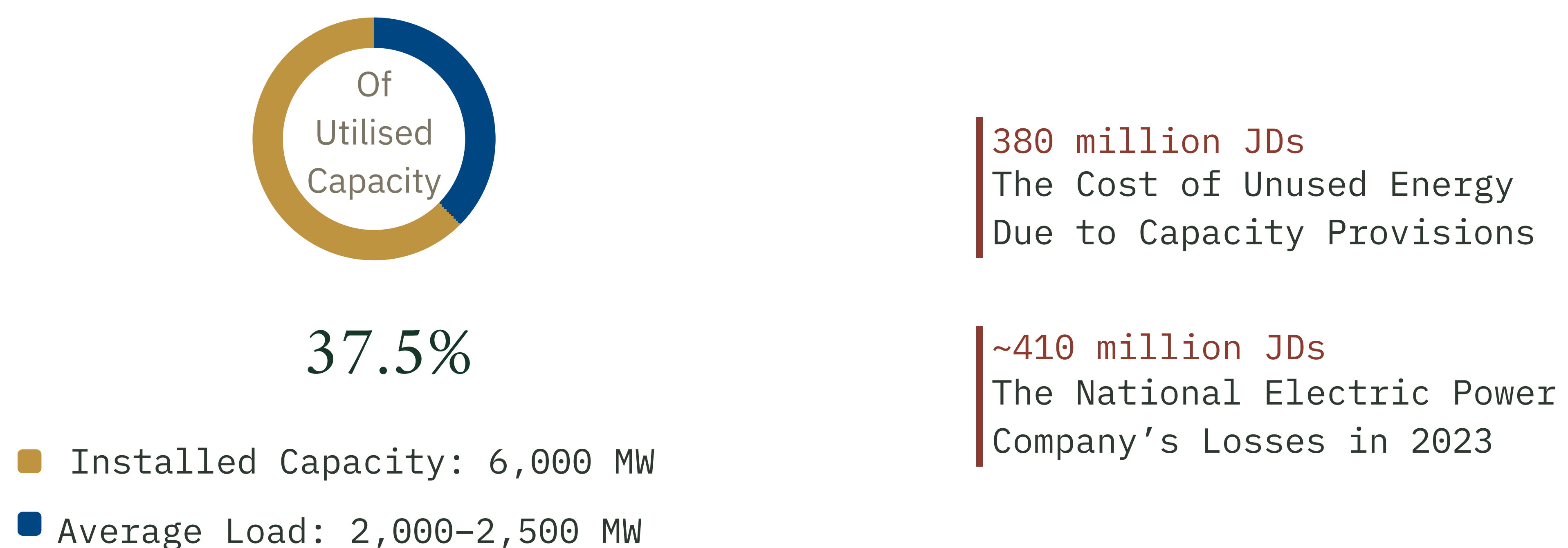


Figure 3: Installed Electricity Generation Capacity and Average Load

(12) Ministry of Water and Irrigation (2026), Official Clarification on the National Water Carrier Project, statement of 5 July 2026, Jordan News Agency (Petra).



## Principal vulnerabilities

Vulnerability in this area is concentrated in five interconnected points:

- Groundwater depletion is virtually inevitable and difficult to reverse. The Disi Aquifer is a closed fossil aquifer which rainfall does not replenish, yet its stock is being drawn in full, and the recovery of renewable aquifers after overextraction takes many years. Groundwater for irrigation will therefore be depleted gradually through natural factors such as drought, and anthropogenic drivers such as over extraction of water and the excessive drilling of wells.
- The cost of water faces a fundamental transformation tied to the energy sector. The Aqaba–Amman project (the National Water Carrier) will deliver around 300 million cubic metres a year by the end of the current decade, a substantial new source, although it will not eliminate the projected deficit on its own. The scale of its capital cost and the high energy intensity it requires are likely to reshape the entire cost structure of water. The Ministry of Water and Irrigation has indicated that water sector debt, which exceeds 4 billion dinars (around 12% of public debt), is on course to reach around 15 billion dinars by 2040 unless reforms, loss-reduction plans, and the treatment of energy costs are completed. This process has already begun through a water tariff reform programme running to 2029 that takes account of fairness across consumption bands and sectors.<sup>(13)</sup>
- There is a sharp divergence in the severity of climate change impacts. Rain-fed agriculture (wheat, barley, olives, and natural rangeland) is directly exposed to declining and increasingly erratic rainfall, while irrigated horticulture faces medium-term pressure from falling water levels in the wells on which it depends for irrigation.
- Water losses represent the largest wasted resource and the cheapest to recover. Around 41% of municipal supply is lost before reaching the consumer, for physical and commercial reasons, equivalent to a loss of around 212 million cubic metres a year out of a municipal supply of around 518 million cubic metres. Reducing losses by each percentage point therefore saves around 5.2 million cubic metres a year in practice, which means that meeting the National Water Strategy target of cutting losses below 25% by 2040 could recover between 80 and 110 million cubic metres a year. This volume is equivalent to approximately one-quarter to one-third of the planned output of the Aqaba–Amman desalination project but could be secured at substantially lower cost, provided that investment in repairing and upgrading supply networks continues, enforcement against illegal connections is strengthened, and tariff reform progresses.
- Jordan's reliance on transboundary water supplies creates a further vulnerability: the relevant agreements are not fully implemented and lack enforceable arbitration mechanisms, making the quantity of incoming water dependent on political relations rather than the hydrological cycle. This is a vulnerability that technical investment alone cannot address unless it is coupled with an effective negotiating track to recover the entitlements set out in the agreements.

(13) Ministry of Water and Irrigation (2026), Official Clarification on the National Water Carrier Project, statement of 5 July 2026, Jordan News Agency (Petra).



## Resilience characteristics and classification

| Dimension                                                                 | Reading                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Robustness</b><br>(the capacity of systems to withstand shocks)        | Relatively low, given increasing depletion of resources, limited tolerance of multi-year drought, and the geopolitical exposure of Yarmouk water.                                                                                                                                                                   |
| <b>Redundancy</b><br>(the existence of backup systems and spare capacity) | Being strengthened through the Aqaba–Amman project, the reuse of treated wastewater, and Disi conveyance, all of which increase available supply, alongside an opportunity to raise the economic value per cubic metre by diversifying the crop map.                                                                |
| <b>Resourcefulness</b><br>(the capacity of systems to mobilise resources) | High, as shown by the international financing secured for the Aqaba–Amman project from 29 international financing institutions, alongside a Treasury contribution (722 million US dollars) and local banks (around 1.1 billion dollars), and by the resumption of the joint negotiating track on the Yarmouk Basin. |
| <b>Responsiveness</b><br>(response)                                       | Constrained by infrastructure, as the response time to acute water shocks is governed by the capacity of existing networks and sources.                                                                                                                                                                             |
| <b>Recovery</b>                                                           | Very slow in structural shocks: recovery from the loss of a major aquifer or a permanent cut in Yarmouk flow is measured in decades, despite the recent resumption of negotiations which opened a contractual recovery route that was not previously available.                                                     |

Table 2: Reading the five dimensions: the natural resources area

Applying the vulnerability classification matrix, the natural resources area is classified as highly vulnerable, given its principal and decisive impact on the performance of all other areas, as well as the high likelihood of being affected by increasing depletion and climatic and geopolitical exposure. This makes it the highest priority for rapid intervention.

Natural resources are the binding constraint and the foundation that sets the developmental and operational ceiling for the remaining sectors; no future vision for the system can be formulated in isolation from the water and energy sectors, which are its decisive drivers. The strategic decisions of the coming five years, particularly those concerning the pricing of Aqaba–Amman project water, the linking of pumping operations to surplus generating capacity, the reallocation of agricultural water shares, the reduction of water losses, and the recovery of contractual entitlements to Yarmouk water, are therefore the ones most likely to make a decisive difference and to determine the effective operating range of the system and its capacity to withstand shocks until 2040.

## 3.3 The trade and imports area

### Current situation

Jordanian food security relies more on a carefully managed import system than on domestic production. Jordan imports the greater part of its primary commodities through a single maritime outlet, the Port of Aqaba, and offsets this exposure with a substantial strategic reserve managed by the Jordan General Silos and Supply Company and the Ministry of Industry, Trade, and Supply. Storage capacity is organised through two complementary forms of infrastructure: vertical silos and ground-storage facilities.



Vertical silo capacity stands at around 740,000 tonnes, distributed across Juwaida (255,000 tonnes), Irbid (150,000 tonnes), Russeifa (135,000 tonnes), and Aqaba (200,000 tonnes). The Port of Aqaba serves as the main point of entry with its port silos, with a discharge rate of around 18,000 tonnes in 24 hours, among the highest in the region.

Ground storage capacity stands at around 1.4 million tonnes, distributed across Ghabawi (350,000 tonnes), Mafrag (160,000 tonnes), Muwaqqar (400,000 tonnes) and Qatrana (more than 500,000 tonnes). With the completion of the Qatrana storage project at the end of 2025, total storage capacity for wheat and barley rose from around 1.6 million tonnes to around 2.2 million tonnes, in line with the targets of the Economic Modernisation Vision and Cabinet decisions on maintaining the strategic stock.

Moving from storage capacity to actual stock, the most recent statements by the Ministry of Industry, Trade, and Supply and the General Silos Company at the start of 2026 indicate monthly consumption of around 95,000 tonnes of wheat and around 80,000 tonnes of barley. An accurate assessment of the reserve requires a distinction between three levels: physical stock held in warehouses, quantities in transit, and quantities contracted but not yet shipped.

According to ministry data, the actual wheat balance stood at around 610,000 tonnes, sufficient for 6.4 months, to which around 302,000 tonnes contracted and in transit are added, sufficient for a further 3.2 months, bringing declared coverage to approximately ten months. For barley, the actual balance stood at around 609,000 tonnes, sufficient for seven months, with a further 220,000 tonnes in transit, sufficient for 2.5 months, bringing declared coverage to eight to nine months. The volume physically stored in warehouses therefore provides only around six to seven months of coverage, while approximately one-third of the declared coverage depends on quantities that have yet to arrive and are consequently more vulnerable to disruption if the shipping corridor is interrupted or closed.

## Principal vulnerabilities

Vulnerability in this area is concentrated in five interconnected points:

- Reliance on a single maritime chokepoint: Most food passes through the Port of Aqaba. Any disruption to shipping or port operations is rapidly transmitted through higher import costs and longer shipping times, ultimately affecting the prices paid by consumers. The Bab-el-Mandeb and Red Sea crisis demonstrated this vulnerability, when general cargo flows through Aqaba fell by around 46% and vessels were forced to undertake costly rerouting through Mediterranean ports.
- Dependence on a limited number of import sources for certain commodities: This leaves the system exposed to producer or exporter shocks, including export ban policies or weather disruption in the country of origin, which underlines the importance of diversifying suppliers alongside diversifying routes.
- Dependence on a limited number of import sources for certain commodities: This leaves the system exposed to producer or exporter shocks, including export ban policies or weather disruption in the country of origin, which underlines the importance of diversifying suppliers alongside diversifying routes.



- The fiscal cost of a substantial reserve: Holding a reserve approaching ten months provides exceptional robustness but places a considerable cost on the budget, and it does not address the risk of a constricted outlet, which makes route diversification and secondary storage a necessary complement rather than an alternative.
- Jordan's reliance on transboundary water supplies creates a further vulnerability: the relevant agreements are not fully implemented and lack enforceable arbitration mechanisms, making the quantity of incoming water dependent on political relations rather than the hydrological cycle. This is a vulnerability that technical investment alone cannot address unless it is coupled with an effective negotiating track to recover the entitlements set out in the agreements.

## Resilience characteristics and classification

| Dimension                                                                 | Reading                                                                                                                                                                                  |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Robustness</b><br>(the capacity of systems to withstand shocks)        | High, and the principal strength of the system in this area (a stored and contracted reserve extending to ten months, and an effective subsidy system that stabilises supply and price). |
| <b>Redundancy</b><br>the existence of backup systems and spare capacity)  | Medium: diversity among suppliers, but governed by a single maritime outlet and by alternative routes at higher cost.                                                                    |
| <b>Resourcefulness</b><br>(the capacity of systems to mobilise resources) | High: the capacity for emergency contracting and rerouting through alternative ports proved itself during the Bab-el-Mandeb crisis.                                                      |
| <b>Responsiveness</b><br>(response)                                       | Relatively rapid, given the daily stock monitoring system developed since the COVID-19 pandemic.                                                                                         |
| <b>Recovery</b>                                                           | Continuous, but achieved at a financial cost (higher shipping and insurance costs) that does not appear in availability indicators.                                                      |

Table 3: Reading the five dimensions: the trade and imports area

Applying the vulnerability classification matrix, the trade and imports area is classified as high vulnerability, given that it is simultaneously the main stabiliser of the system and its largest source of risk; any failure at the Aqaba outlet or in import sources passes directly into the cost and stability of food. The priority here is not only deeper stock, since stock is already substantial, but also reducing this dependency through diversified routes, ports, and suppliers.

## 3.4 The production area

### Current situation

High value-added horticulture in the Jordan Valley dominates the export structure of the agricultural sector. Tomato production recorded around 563,500 tonnes in 2024, of which more than 226,000 tonnes were exported, achieving a self-sufficiency ratio of around 167%. Tomato productivity rises from around one tonne per dunum in the open field to around 6 tonnes with drip irrigation and then to around 20 tonnes in greenhouses, which demonstrates the value of technological solutions in maximising the economic return per cubic metre of water.

(14) National Agricultural Research Center (NARC) (2018/2024), Technical Guide to Tomato Production in Jordan, second edition.



The production system is complemented by other sub-sectors that bring balance to food security. Foremost among these are the poultry and dairy sectors. The poultry sector achieves self-sufficiency and an export surplus with annual production of around 250,000 tonnes of broiler chicken and one billion table eggs, while the dairy sector meets domestic requirements for fresh milk in full despite its structural dependence on imported feed. The olive sector is similarly prominent, with considerable growth of 43.2% in the 2024/2025 season and production estimated at around 35,828 tonnes of oil, alongside the dates sector (particularly the Medjool variety). The stone fruit sector (apricots and peaches), concentrated in Mafraq Governorate, also represents a strategic extension of the high-value production and water-rationalisation agenda, given its export potential and lower water consumption compared with other crops.

## Principal vulnerabilities

Production faces five principal vulnerabilities:

- Limits to water productivity: Some farmers use between two and five times the amount of water required by their crops. Improving water productivity therefore requires investment in modern agricultural technologies, particularly efficient irrigation systems, alongside behavioural change among farmers through targeted training. Addressing this constraint requires a range of complementary measures.<sup>(15)</sup>
- Crop and market concentration: The concentration of exports in a small number of Gulf markets and of production in tomatoes and cucumbers exposes farm incomes to fluctuations in demand, sharp price declines, and competition from lower-cost producers.
- Dependence on feed: Self-sufficiency in poultry and dairy is real in the final product and nominal in terms of inputs, since feed is mostly imported, and any shock in the feed market would feed through into production costs and retail prices within months.
- Fragility in the labour structure: Agricultural labour depends on migrants and refugees, whose output is constrained by rising work-permit costs. Combined with demographic ageing among smallholder farmers, this combination is unlikely to support any substantial expansion in labour-intensive horticulture.
- The fragility of smallholder farmers: Smallholders represent the overwhelming majority of those working in the rain-fed highlands, the natural rangelands and the Jordan Valley, yet they suffer from an economic weakness that makes them the group most affected by droughts and by rising prices for feed and production inputs. This is compounded by their difficulty in obtaining loans, extension services and agricultural insurance. Any natural or economic shock they face therefore causes damage that goes beyond financial losses and reduced production, extending into a social crisis that bears directly on the stability of their households and their livelihoods.

(15) U.S. International Trade Administration (2026), Jordan – Environment and Water Sector, Country Commercial Guide, <https://www.trade.gov/country-commercial-guides/jordan-environment-and-water-sector>



## Resilience characteristics and classification

| Dimension                                                                 | Reading                                                                                                                                                    |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Robustness</b><br>(the capacity of systems to withstand shocks)        | Moderate and uneven; greenhouse horticulture and highland stone fruit are more robust, while rain-fed cereals and pastoral livestock are less so.          |
| <b>Redundancy</b><br>(the existence of backup systems and spare capacity) | Present in the diversity of sub-sectors (horticulture, poultry, dairy, olives, dates, stone fruit), but governed by a shared dependence on feed and water. |
| <b>Resourcefulness</b><br>(the capacity of systems to mobilise resources) | Supported by declared investment priorities and by the high-value industries pillar of the Economic Modernisation Vision.                                  |
| <b>Responsiveness</b><br>(response)                                       | Uneven by sub-sector; poultry and dairy can recover within months from a feed shock, whereas olive trees and natural rangeland cannot.                     |
| <b>Recovery</b>                                                           | Varies by sub-sector, and is strengthened by institutional learning.                                                                                       |

**Table 4: Reading the five dimensions: the production area**

The COVID-19 pandemic provided a critical empirical assessment regarding the disparate levels of resilience across production sub-sectors. Livestock enterprises demonstrated superior structural robustness, attributable to pre-existing refrigeration, storage, logistics, and processing capabilities; by contrast, crop production faced operational constraints due to the absence of comparable infrastructure. In response, state interventions prioritised investment in cold-storage facilities and post-harvest handling centres to enhance systemic resilience. This response illustrates operational responsiveness, post-crisis recovery, and institutional learning.

Applying the matrix, this area is classified as medium vulnerability (a high likelihood of being affected by exposure to feed, water and climate, but a medium impact at the system level attributable to the diversity of sub-sectors and their capacity to recover). Domestic production cannot substitute for imports on any large scale, but it can serve as the engine of a high-value agri-food economy generating exports and jobs. The strategic choice here is to deepen high-value, water-efficient products rather than to pursue self-sufficiency in calories.

## 3.5 Agri-food industries and import substitution

### The scale and economic importance of the sector

The food, supply, agricultural, and livestock industries sector is the industrial branch most closely linked to food security and everyday consumption. According to the Jordan Chamber of Industry, the sector comprises around 2,600 establishments and employs approximately 66,500 people. Its registered capital is around 674 million Jordanian dinars, and its annual output is approximately 4.5 billion dinars, equivalent to 28% of manufacturing output. Value added is estimated at around 40% of sectoral output, or approximately 1.8 billion dinars. Every dinar of spending in the sector contributes around 2.6 dinars to the national economy through direct and indirect effects, while its direct contribution to output is around 6% (and around 15% once both effects are counted together), which makes it the instrument most capable of converting primary production into jobs and export earnings.



The sector meets approximately 62% of domestic demand. More than 70% of company sales are directed towards the agri-food sector. Exports reached around 926 million dinars in 2025, a rise of 11% on the 834 million recorded in 2024, and reached 114 countries at a compound growth rate of around 15.3% over 2018–2025. Its principal markets are Saudi Arabia (around 23%), Iraq (19%), and the United Arab Emirates (11%), and it has unrealised export potential estimated at around 310 million US dollars, particularly in processed products, dairy, eggs, and honey. The Economic Modernisation Vision places the sector among the priority sectors, targeting by 2033 an increase in its exports from around 0.9 to 4.3 billion dinars, in its contribution to output from 1.5 to 2.9%, and in its workforce from 37,700 to 71,500 workers.

## Structural challenges facing the sector

A reading into the foreign trade data for 2025 reveals significant supply gaps in a number of livestock production inputs and semi-processed food products. These gaps create opportunities for both import substitution and domestic investment, since they address a broad domestic market with stable demand. The most prominent of these fields are the production of frozen potato products for frying, the manufacture of semi-processed food products, the refining and packaging of vegetable oils, the production of food blends, and the manufacture of protein feeds and feed concentrates, which link domestic livestock production to manufacturing and reduce the livestock sector's exposure to imported feed inputs identified in the production analysis.

A large part of the imports of the food and supply industries is concentrated in a limited number of sources: Saudi Arabia and Brazil each account for around 10%, and Romania, India, and Egypt for around 6% each, with variations in the composition of imported goods that help to identify specific supply gaps. Feed inputs come from Brazil and Romania; pasta and bakery preparations, milk powders, and butter come from India and Egypt; while refined sugar and beverages come from Saudi Arabia. This import profile can guide investment priorities: wherever the gap lies in an intermediate input that can be manufactured locally (such as feed, oils, and semi-processed goods), the opportunity for substitution is stronger, provided that products requiring raw materials not economically available domestically are set aside.

In sum, deepening the food industries is a rare point of convergence between resilience and growth; it mitigates exposure in feed and semi-processed products on the import side, raises value added, employment, and exports on the growth side, and links domestic agricultural production to manufacturing, provided that its three constraints are addressed, namely the vulnerability of imported inputs, the cost of energy, and the access of small and medium-sized enterprises to financing. These constraints in the production area intersect with the other three thematic areas (natural resources, trade and imports, and governance) and make the sector a microcosm of the interdependence of the system as a whole.

## 3.6 The governance area

### Current situation

Food security governance in Jordan takes the form of an institutional, legislative, and coordinating system led by the Higher Council for Food Security, encompassing strategic planning, data management, decision-making, cross-sectoral policy coordination, and implementation monitoring, in line with the National Food Security Strategy and the pathway of agri-food system transformation. Sectoral competences are distributed among several bodies in a complementary manner; the Ministry of Agriculture leads on crops and livestock, the Ministry of Water and Irrigation manages water, the Ministry of Industry, Trade and Supply is responsible for imports, reserves, and prices, and the Ministry of Social Development administers the



Takaful (Arabic: تكافل, lit: “solidarity”) programme through the National Aid Fund. The National Food Security Strategy 2021–2030 rests on integrated strategic components: the availability of food, access to it, its stability and optimal utilisation, and the strengthening of governance.

The institutional framework for coordination has followed a gradual process of institutional development. Before the current institutional framework was adopted, work on food security coordination was conducted through a range of governmental arrangements and committees, and it then moved gradually towards a more institutionalised and pluralistic model: The National Food Security Committee was reconstituted under the chairmanship of the Minister of Agriculture and with membership comprising all relevant stakeholders. The Committee led the development of the first National Food Security Strategy through a participatory process involving the various sectors. In 2023, the Food Security Council System No. 43 of 2023 was approved, establishing the Council under the chairmanship of the Minister of Agriculture. The system was subsequently amended in 2025, reconstituting the body as the Higher Council for Food Security, chaired by the Prime Minister, with the Minister of Agriculture serving as Vice-Chair. The establishment of the Council is among the most significant achievements of the Strategy, accompanied by the Food Security Information System launched in October 2024. Among the Council’s most notable decisions are the designation of the Department of Statistics as the official body authorised to issue statistical data and information and the adoption of the Regional Food Security Observatory, whose pilot version was launched in mid-2026 with six member states: Jordan, Egypt, Iraq, Palestine, Lebanon, and Syria. A monitoring and evaluation system for the projects of the Food Security Action Plan 2025–2027 is currently being developed within the Food Security Information System, followed by an early-warning system at a later stage.

The Food Security Action Plan and Indicator Improvement Plan 2025–2027 illustrates the scale of the institutional effort underway. The preceding plan for 2022–2024 implemented seventeen projects at a total cost of around 28.6 million dinars, of which around 23% were completed, while around 59% were ongoing programmes embedded in the plans of several bodies, and around 18% had not begun. The initiatives of the 2025–2027 plan are distributed across four strategic objectives (ensuring the availability of food, improving access to it, strengthening its stability and optimal utilisation, and strengthening governance), with a total value for projects and initiatives approaching 1.038 billion dinars, allocated across the budgets of the implementing bodies. The Unified Cash Support Programme, delivered through the National Aid Fund, accounts for around 819 million dinars of that total (an average of 273 million dinars a year), which reflects the substantial fiscal importance of social protection within the food security system.

The plan’s priorities are translated into projects with measurable implementation indicators that intersect directly with the thematic areas of this study. As for strategic reserves, the Qatrana storage facilities project aimed to raise storage capacity for wheat and barley. As for access, the school feeding programme covers around 520,000 pupils in areas of concentrated poverty and refugee camps at a cost approaching 38 million dinars. As for governance, funding is provided for the maintenance of the Food Security Information System, the incorporation of the Consolidated Approach for Reporting Indicators of Food Security (CARI) and Food Insecurity Experience Scale (FIES) measures into statistical analysis, and the launch of a national programme of periodic food and health surveys, which are projects designed to address the data gaps identified in governance. The plan is financed by a mix of general budget allocations, allocations from the national implementing bodies, partnerships, and international grants, while securing sustainable financing for some initiatives remains one of the implementation requirements.



## Principal vulnerabilities

The principal governance challenges are concentrated in four points:

- Deepening practical coordination between institutional competences: Given the multi-sectoral nature of food security, in which the water, agriculture, trade, energy, social protection, and refugee-related responsibilities are distributed among several bodies with overlapping competences, deepening practical coordination and unifying follow-up mechanisms across the various bodies remains a continuing priority, particularly in the implementation of joint initiatives.
- Ensuring coherence among the multiple sectoral frameworks and strategies: The Economic Modernisation Vision, the Public Sector Modernisation Roadmap, and the water, agriculture, green growth, food security, and energy strategies all intersect, and ensuring coherence among them is a continuing challenge for governance that calls for a stronger linkage between objectives, performance indicators, and implementation plans.
- Sustaining the system's financial allocations: Food security resilience depends on the continued fiscal capacity to subsidise bread and essential commodities, finance the Takaful social-solidarity programmes, and maintain strategic-reserve levels. This must be achieved within a public-finance context constrained by debt obligations and the cost of hosting refugees. The decline in international funding earmarked for refugees continues to place pressure on beneficiary households, the social-protection system, and public services, reinforcing the importance of sustained burden-sharing by the international community.
- Gaps in the updating of some sectoral data. Notwithstanding the significant institutional progress in the management of food security data, through the establishment of the Food Security Information System, the designation of the Department of Statistics as the official reference for data, the conduct of national surveys, and the development of monitoring, evaluation and early warning tools, some sectoral databases still require more regular updating, including certain specialised agricultural and household data.

## Resilience characteristics and classification

| Dimension                                                                 | Reading                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Robustness</b><br>(the capacity of systems to withstand shocks)        | Moderate: institutions and strategies are in place, with a high-level institutional framework chaired by the Prime Minister.                                                                                                             |
| <b>Redundancy</b><br>(the existence of backup systems and spare capacity) | Medium: the number of institutions involved allows multiple response pathways, although institutional multiplicity does not in itself constitute a backup unless the mechanisms of integration between them are codified.                |
| <b>Resourcefulness</b><br>(the capacity of systems to mobilise resources) | Moderate: the system has national capacity to mobilise resources, although financing gaps continue to affect the pace of implementation.                                                                                                 |
| <b>Responsiveness</b><br>(response)                                       | A strong capacity to respond has been demonstrated across successive shocks, with a need for further codification of response protocols between bodies and for linking them to early warning systems.                                    |
| <b>Recovery</b>                                                           | The system has demonstrated a practical capacity to restore stability after shocks, with the importance of developing more systematic methodologies for measuring the economic and financial cost of shocks and of the response to them. |

Table 5: Reading the five dimensions: the governance area



Applying the matrix, this area is classified as low vulnerability; although the impact of any failure of coordination transmits to all the other areas, the likelihood of acute failure remains low, given the existence of a high-level institutional framework, established institutions and strategies, and binding decisions. It is simultaneously the area with the greatest capacity to raise the resilience of the agriculture and food system in Jordan, since it affords the largest improvements at the lowest financial cost. Strengthening the institutional and technical capacities of the unit serving as the Council's secretariat, developing mechanisms for monitoring, accountability, and joint implementation among the member bodies, further developing its information system while completing the monitoring and evaluation system and the early warning system, codifying response protocols between bodies, and strengthening coherence among the multiple strategic frameworks are all factors that multiply the returns on every other investment in the system.

Read together, these developments, from the approval of the Council's system and the elevation of its chairmanship, to the establishment of its technical and financial committees, the development of its information system, the strengthening of the role of the Department of Statistics, and the participatory adoption of its action plan in 2025, are clear indicators that food security governance in Jordan has moved from an initial establishment phase to a more mature phase of institutionalisation, integration, and data-driven follow-up.

## 3.7 Sub-sectoral analysis

Operational decisions are ordinarily taken at the sub-sectoral level, and this section reads the principal sectors through a dual lens: the sector's role in resilience (is it a stabiliser of supply or a source of exposure?) and its capacity for high value production (does it generate export and employment opportunities?).

The table below is read according to the following criteria: the higher a sector's value and the lower its principal vulnerability, the closer it comes to being a lever of growth and of resilience at once; and the higher its vulnerability, the greater the need for targeted intervention. Cereals, for example, are low in value and highly dependent on imports, and are therefore a sub-sector requiring risk management rather than import substitution, whereas horticulture and the food industries are high in value and are therefore a field for investment and expansion, and livestock is evidently self-sufficient yet exposed in its feed inputs.

| Sector                       | Role in resilience                                                                                                              | High value                                       | Principal vulnerability                                        |
|------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------------------------|
| <b>Cereals</b>               | Domestic production provides coverage sufficient for approximately one week of consumption, so it cannot substitute for imports | Low; characterised by high water intensity       | Climatic variability; structural dependence on imports         |
| <b>Fruits and Vegetables</b> | Play a pivotal role in the export market (tomatoes around 563,000 tonnes, 2024)                                                 | High; a principal source of value                | Water intensity; concentration of Gulf markets                 |
| <b>Livestock and dairy</b>   | Achieves self-sufficiency in milk, while domestic production covering 35.9% of Jordan's red meat requirement                    | High, particularly in the processed dairy sector | Exposure of the feed sector; degradation of natural rangelands |



| Sector                      | Role in resilience                                                                      | High value                                                         | Principal vulnerability                                                                           |
|-----------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Poultry and eggs</b>     | Achieves self-sufficiency with a surplus directed to export                             | Medium; rests on regional export                                   | Feed exposure; disease; energy                                                                    |
| <b>Olives and olive oil</b> | A resilient rain-fed crop that supports rural livelihoods and domestic production       | High; export opportunities resting on high quality                 | Seasons of severe drought; variability in annual production volumes                               |
| <b>Dates (Medjool)</b>      | Agricultural and investment expansion in the Jordan Valley and Aqaba areas              | High; supported by excellent and competitive export performance    | High water intensity; concentration of export markets                                             |
| <b>Fish</b>                 | Small and limited volume of production (around 2.1 tonnes, 2021)                        | Specialised, and confined to particular niches                     | The high cost of water; Jordan's limited coastline                                                |
| <b>Food manufacturing</b>   | Comprises around 2,600 establishments and achieves exports of around 926 million dinars | Very high; constitutes a fundamental mainstay of national industry | Dependence on imported inputs; high energy costs; limited access to finance for small enterprises |

Table 6: Reading the sub-sectors through the lens of resilience and high value

## Cereals

Cereals, and wheat in particular, are a central strategic component of the food system; domestic wheat production only covers around one week of consumption per annum, and structural dependence on imports increases in years of low rainfall. The strategic reserve, held in storage and incoming from signed contracts, which covers Jordan's requirement for ten months, is the principal mechanism for withstanding shocks. The sector cannot substitute for imports within any realistic water budget. Therefore, the strategic question is one of organisation rather than of volume: how strategic reserves, imports and the wheat flour subsidy should be managed so as to manage the dependence inherent in the system.

## Fruits and Vegetables

The horticulture sector represents the pivotal economic mainstay and the strategic instrument for maximising high value in the agricultural sector. The data show high productivity arising from the adoption of modern technologies; tomato yields rise from around one tonne per dunum in open-field cultivation to around 20 tonnes under greenhouses, thereby improving water-use efficiency and economic returns per unit of water. Notwithstanding these promising opportunities, the sector faces fundamental challenges to its stability, namely concentration in crops and in markets, the risks of pests and plant diseases, high sensitivity to policies for the reallocation of water resources that do not take structural differences into account, and the precarious legal and economic conditions faced by migrant workers. Taken together, these features place the sector in a grey zone that combines promising developmental prospects with a high exposure to risk.



## Livestock, dairy, and poultry.

The livestock sector is distinguished by a structural complementarity that combines traditional pastoral systems with intensive production enterprises. Pastoral herds (numbering 3.8 million head according to the 2020 census) support rural livelihoods despite climatic challenges and the degradation and drying of natural rangelands, while commercial dairy farms play a pivotal role in meeting domestic demand for fresh milk. The analytical evidence reveals this sector's dependence on external supply chains to secure basic feed inputs, with annual imports estimated at around 900,000 tonnes of barley, between 650,000 and 750,000 tonnes of maize, and 350,000 tonnes of soybean meal, which underlines the sensitivity of food security to fluctuations in global markets. The poultry sector, by contrast, constitutes an advanced model of import substitution and of the generation of exportable production surpluses, with annual output approaching 250,000 tonnes of meat and one billion eggs across 2,689 production facilities. The sustainability of these positive indicators nonetheless remains conditional on raising the efficiency of biosecurity measures, developing energy management systems, and ensuring reliable feed supply chains.

## Olives, dates, and fish

The 2024/2025 season saw notable growth in olive oil production, at 43.2% year on year, reaching around 36,000 tonnes, with Irbid Governorate leading that production. This sector is distinguished by its capacity to provide livelihoods for a broad segment of the rural population, particularly the older age groups, alongside the generation of promising export opportunities whose added value depends on branding and international quality certification. Climate change nonetheless stands out as a principal structural threat, one that pushes Jordan towards greater reliance on imports in drought years. In a similar context, the dates sector has recorded rapid expansion in the cultivation of the Medjool variety in the Jordan Valley and Aqaba areas, in preparation for raising export capacity; yet its character as a water-intensive activity places it in direct competition with the horticulture sector for water shares, which makes the prospects for its future expansion contingent on the trajectory of the cost and availability of water. Aquaculture, by contrast, remains limited in overall scale (at around 2.1 tonnes according to 2021 data), its growth governed by two principal constraints: the cost of water and Jordan's limited coastline along the Gulf of Aqaba.

## 3.8 Summary of vulnerability classification across the thematic areas

The table below distinguishes between the two vulnerability classification (the product of impact and likelihood) and the priority of intervention, which rests on the principle of achieving the highest return. Governance is classified as low in vulnerability yet high in priority, because the cost of improving it is low: a fundamental distinction that drives the ordering of the recommendations set out later.

| Thematic area     | Severity of impact | Likelihood of being affected | Classification       | Sequence of intervention           |
|-------------------|--------------------|------------------------------|----------------------|------------------------------------|
| Natural resources | High               | High                         | High vulnerability   | 1. The binding constraint          |
| Trade and imports | High               | High                         | High vulnerability   | 2. Fortifying the stabiliser       |
| Governance        | High               | Low                          | Low vulnerability    | 3. Highest leverage at lowest cost |
| Production        | Medium             | High                         | Medium vulnerability | 4. Deepening high-value production |

Table 7: Summary of vulnerability classification and priority of intervention across the thematic areas



### ◆ Diagnosis summary

- *Water, together with energy, is the binding constraint, and trade is the stabiliser that must be fortified; while production offers a route to higher value added rather than an instrument of self-sufficiency, and governance is the highest point of leverage at the lowest cost.*
- *Classification is distinct from intervention priority. Governance is low in vulnerability yet the highest in priority, because improving it is the least costly and the widest in effect.*



# 4. Systemic Analysis: How the System Moves Under Pressure

The real diagnostic value lies not in any single area but in how the areas interact as one system. The previous chapter showed that each of the four areas has its own vulnerabilities and its own resilience characteristics, yet Jordan does not meet its shocks area by area; it meets them in an interlocking form of considerable complexity. This chapter therefore draws the threads of the diagnosis into a single picture: it first maps the pathways along which shocks are transmitted between the areas, then reads the successive shocks since 2020 as a natural experiment that has tested the system, then connects this to the dimension most often overlooked in analyses of food security, namely purchasing power and social resilience, before drawing out the core trade-offs and the leverage points, and closing with a forward-looking analysis that prepares the ground for conclusions.

## 4.1 Shock transmission pathways

The four thematic areas are bound together by a network of pathways along which shocks pass from one area to another. Understanding these pathways is the essence of systemic diagnosis, since it reveals why the greatest risk arises when shocks occur simultaneously rather than separately. Five principal pathways may be identified:

### **Water → production → trade**

Water scarcity places a natural ceiling on domestic production and so fixes dependence on imports at high levels irrespective of agricultural policy. Efforts to increase self-sufficiency through water-intensive crops may accelerate aquifer depletion and raising the future cost of water, weakening high value production. This pathway explains why producing more is a response that runs counter to the objective unless coupled with a reorientation towards high-value production; water operates here as far more than an agricultural input, since it is the variable that binds agricultural policy to trade policy.

### **Trade → the public budget → social protection**

A shock in global prices simultaneously raises the import bill and the cost of subsidies, placing pressure on public finances already constrained by debt and by the cost of hosting refugees; the pressure then passes to social protection, either through a reduction in assistance or through a wider deficit. This pathway is the channel through which an external shock is converted into internal social pressure, and it explains why import policy cannot be separated from social protection policy in a country where food accounts for more than a quarter of the consumer basket.



## Water → energy → cost

The shift towards desalination and long-distance conveyance adds a new pathway of coupling: water desalination and long-distance conveyance become energy-intensive, while energy in Jordan is imported and exposed to geopolitical shocks, so that an energy shock passes into the cost of water and thence into the cost of agricultural and industrial production. The leverage point latent in this pathway is the design of the Aqaba–Amman project together with work to reduce losses in the water networks so that the constraint is converted into savings. It is this that renders decisions on water, energy, and agriculture a single decision rather than three parallel ones.

## Feed → livestock → high-value

Apparent self-sufficiency in poultry and dairy rests on feed that is almost wholly imported; a price shock in feed markets therefore passes within months into production costs and retail prices and threatens one of the most important components of the high-value agenda. Reducing this vulnerability requires the storage of feed and a diversification of its sources matching what is already in place for wheat, and it intersects directly with the import substitution opportunities in feed concentrates identified in the section on the food industries.

## Climate → rain-fed agriculture → rural livelihoods

Rainfall variability affects rain-fed agriculture and natural rangelands directly, disrupting the incomes of smallholder farmers and herders and weakening rural livelihoods and their associated identity. This is a social pathway as much as an economic one, and it explains why the resilience of production cannot be reduced to output indicators alone. The overall conclusion from the five pathways is that the vulnerability lies in their concurrence rather than individually since each link is manageable on its own, whereas their combined effect may exceed the system's capacity to absorb them.

Reading the system through single pathways alone is incomplete, as the diagnosis reveals a self-reinforcing vicious cycle that explains why partial reforms fail. The circle begins with a rise in the cost of energy, which raises the cost of pumping and desalinating water. The agricultural tariff rises in turn, and as it rises farm income falls, generating political pressure to widen subsidies. The wider the subsidy grows, the narrower the financial resources available to the state, so investment in the rehabilitation of the networks declines, losses rise, increasing network losses and raising the unit cost of water supplied, and the circle returns to its point of departure. Reforming a single link is therefore insufficient, since the remaining links soon return the system to its starting point unless several points are addressed at one and the same time. Figure 5 below summarises this circle and its pathways.





Figure 5: The vicious cycle

## 4.2 A closer examination of the shocks since 2020

The successive shocks since 2020 provide a natural quasi-experiment for testing the system under pressure, and reading them in sequence reveals how the test escalated from a shock in a single area to concurrence across the areas. The COVID-19 pandemic began in 2020 by testing supply chains and domestic production; it revealed uneven resilience within the production sector (the robustness of livestock farms, sustained by their infrastructure, while crop farms were more adversely affected) and prompted the development of mechanisms for monitoring the strategic stock on a daily basis. The Russo–Ukrainian War of 2022 then struck global cereals, feed and energy markets, raising the import bill and the cost of subsidies, and tested directly the pathway running from trade to the public budget to social protection; strategic reserves enabled the system to absorb the shock, though at an escalating financial cost.

In 2023–2024 the shipping crisis in Bab-el-Mandeb and the Red Sea turned from a geopolitical event into a logistical shock that reduced the flow of general cargo through Aqaba by around 46% and forced rerouting through Mediterranean ports, which raised costs and shipping times. It thus placed pressure on the cost of imports and on the cost of the wheat flour subsidy at a time when the World Food Programme had suspended assistance to around 135,000 refugees, so that logistical, financial, and social costs intersected simultaneously. The system absorbed the shock by virtue of distributed storage and rerouting, but it did so only at a significant financial cost, a fundamental distinction between withstanding shocks and sustainable resilience.



The recent regional and international conflicts of 2026 then tested the escalating water–energy pathway on a wider scale. They were accompanied by the closure of the Strait of Hormuz, through which around 20 million barrels pass daily (around a quarter of global oil trade), and by a rise in Brent crude above 110 US dollars per barrel. This coincided with a halt in the gas supplied from the Leviathan field, which feeds around 60% of electricity generation. The interruption lasted around a month at the beginning of 2026 and was the longest since exports began. The cost of electricity generation rose by around 100 million dinars per month at the peak of the crisis, and the National Electric Power Company activated an emergency plan that included suspending gas supplies to industry and switching to liquefied natural gas and diesel for electricity generation. The crisis threatened food through two gateways at once: trade and the energy inputs required for the pumping, cooling, transport, and processing of water and food. The energy gateway has become a channel of shock transmission to a similar degree as the shipping gateway.

Three complementary lessons emerge from a reading of this sequence: that the most prominent source of resilience was institutional proactiveness (distributed stocks and financing secured in advance), that the cost of withstanding shocks is financial, hidden, and does not appear in indicators of availability; and that the concurrence of a shipping shock and an energy shock is the most dangerous scenario, for which the system should be designed, rather than one to which it merely reacts. These lessons pass directly into the recommendations.

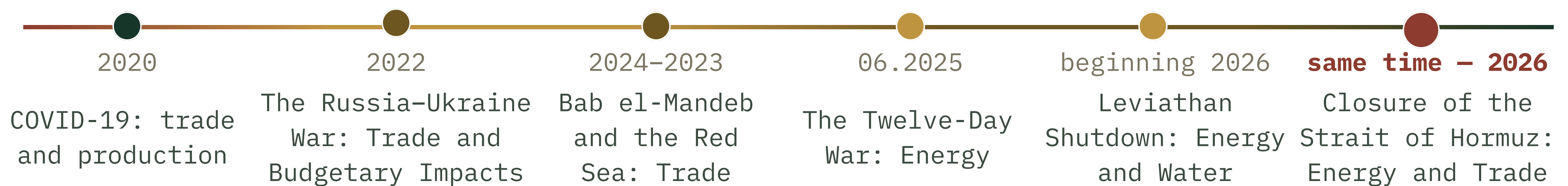


Figure 6: Timeline of Shocks

## 4.3 Purchasing power and social resilience: the household dimension of food security

Food-security analysis tends to focus on the aggregate availability of commodities and on whether a country has sufficient food. In Jordan, however, systemic analysis suggests that the principal point of vulnerability lies in access rather than availability: food remained on the market throughout recent shocks, while the real test was households' ability to afford it. Food security is therefore fundamentally a matter of the state's capacity to ensure that food is available and accessible to all citizens in a stable and secure manner, even during disruption, rather than a matter of domestic self-sufficiency alone. This shifts the focus from the state's reserves to households' ability to obtain food.

In this sense, a household's purchasing can be thought of as the last line of defence in the system. In a country where around 27% of household expenditure is spent on food, and where this share rises far higher among low-income households, every leap in global prices becomes direct pressure on household budgets before it becomes pressure on the public budget. A high-income household absorbs a price shock by adjusting its pattern of consumption without its food security being threatened, whereas a low-income household is compelled to reduce the quality or the quantity of its food so that the economic shock passes directly to the nutritional and health level. Improving citizens' incomes and their purchasing power is therefore in itself an investment in the resilience of the system, since it raises society's capacity to bear disruptions in the system without economic pressure turning into a food security crisis.



It follows that social resilience and food security are two sides of the same phenomenon. The larger the share of households able to absorb price shocks without public assistance, the lower the burden falling on the state's instruments (the wheat flour subsidy and the Takaful programmes), and the greater the fiscal space freed up for reinvestment in deepening resilience itself. The converse also holds; the erosion of purchasing power makes growing segments of the population reliant on public support, so that the financial burden rises at the very moment when the cost of imports rises. This intersection makes an external price shock a double crisis. This study therefore treats income policy and social protection as an intrinsic part of food security policy rather than an appendage to it and places the unification of the instruments of purchasing power among the highest leverage points.

## 4.4 The core trade-offs

The diagnosis identifies four trade-offs that call for clarification:

- Self-sufficiency against productivity: the relationship between achieving self-sufficiency and raising water productivity represents a major economic trade-off. Every cubic metre of water directed towards the cultivation of water-intensive cereals is in reality a cubic metre unavailable for higher-value horticultural production. In this context, the objective of achieving self-sufficiency frequently gives way to the expected economic and investment return on each unit of water used.
- Universal subsidies against targeting: the relationship between universal subsidies and the direction of support (targeting) represents a fundamental trade-off between fiscal efficiency and social peace. A universal wheat flour subsidy affords protection to all groups, but it consumes a large budget and leads to benefits accruing to households that do not require support. Direct targeting, by contrast, is more efficient in fiscal terms, yet it encounters greater administrative complexity and higher political sensitivity in implementation.
- Reserve levels against their cost and the diversification of routes: the management of the strategic stock requires a careful balance between raising reserves and securing alternative routes. Holding wheat reserves, both stored and contracted, sufficient for ten months affords outstanding stability and robustness in the face of crises, but it entails a high financial cost. Increasing the stock is therefore not on its own sufficient to resolve the risks of the logistical chokepoints that may arise at the Port of Aqaba. This reality imposes the need to reconcile an increase in the volume of the stock, a diversification of supply routes, and the development of secondary storage centres, rather than relying wholly on an increase in stored quantities alone to achieve the resilience required.
- Expansion in high-value crops against the natural limits of available water: the cultivation of dates and irrigated horticulture affords high financial returns but consumes large quantities of water. Accordingly, any expansion in these plantings undertaken without due consideration will soon meet the ceiling of the available water shares, which is the same water required for that growth to continue. This interdependence makes any future decision on expansion directly bound to the trajectory of water availability.



## 4.5 Forward-looking analysis: the concurrence scenario

The most prominent lesson of the period 2020–2026, however, is that the most dangerous scenario is the concurrence of two medium shocks in two interconnected areas rather than a single large shock, since their combined effect exceeds the system's capacity for distributed absorption. Such a case is embodied in a hypothetical yet realistic scenario, in which a disruption to shipping in the Red Sea affecting the Port of Aqaba raises the cost of imports and the time required for imports to reach Jordan, alongside an interruption of gas supply that raises the cost of electricity generation and thereby the cost of pumping water and of cooling and processing food in a season of low rainfall that places pressure on rain-fed production so that three channels of pressure converge on public finances at one and the same time.

The significance of this scenario is that resilience is built by building resilience across multiple dimensions of the food system so that no single area becomes a single point of failure when shocks coincide, rather than by maximising a single dimension such as raising reserves. It is from this that the recommendations derive their logic: they address the linkages along which pressure travels rather than each vulnerability in isolation, making the system capable of absorbing concurrence and not merely a single shock.

### ◆ Systemic Analysis Summary

- *The thematic areas constitute a single system in which a shock in one of them passes to the rest; the danger lies in the concurrence of shocks rather than in their occurring individually.*
- *Purchasing power is the last line of defence; improving citizens' incomes is therefore a direct investment in the resilience of the system.*
- *The recommendations address the linkages between the areas, rather than each vulnerability in isolation.*



## 5. Conclusions

The conclusions are presented here as a single coherent reading of the state of the system, assembled from the diagnosis and from the chapter of analysis, rather than as successive answers to the study's questions, and they lead naturally into the directions of the recommendations. They may be summarised in six interconnected points, as follows.

The first conclusion is that Jordan is not short of food; the country is managing a structural exposure with a costly form of success. The system has not broken across a long sequence of shocks, but its ability to withstand shocks rested on conditions such as high reserves, responsive donors and government financial allocations for subsidies, all of which have come under pressure. The right question is therefore how to keep the system resilient across shocks that are difficult to predict and increasingly liable to coincide, rather than how Jordan produces its own food.

The second conclusion is that water, together with energy, is the binding constraint that draws the physical ceiling of the entire system. Production is governed by the water ceiling, and the cost of water is on the verge of transformation through the Aqaba–Amman project, which transfers part of the exposure to imported energy. Decisions on water, energy, and agriculture are accordingly a single decision to be settled in the coming decade rather than three parallel decisions.

The third conclusion is that imports are both the system's principal stabiliser and its greatest source of vulnerability. The substantial strategic reserve is the system's strongest resilience asset, but Jordan's reliance on Aqaba as its sole maritime outlet leaves this robustness exposed to a single bottleneck. The fortification required extends beyond raising the stock to diversifying routes, ports, and suppliers, so that the reserve does not remain the sole line of defence.

The fourth conclusion is that production and its food industries offer a route to higher value added and import substitution rather than an instrument of self-sufficiency. Domestic production cannot replace imports on a large scale within a realistic water budget, but it can be an engine of growth generating exports and jobs through an increase in high-value, water-economical products and in the food industries, which makes production and agri-food industries a rare point of convergence between resilience and growth.

The fifth conclusion is that governance is the highest point of leverage at the lowest cost. Although it is classified as low in vulnerability, it affords the largest improvements at the lowest financial cost, since further institutionalising coordination, through strengthening the institutional and technical capacities of the secretariat of the Higher Council for Food Security, a well-developed Food Security Information System and written response protocols, multiplies the returns on every other investment in the system.

The sixth conclusion is that the thematic areas are interdependent, with a shock in one of them passing to the rest, and that the last line of defence is household purchasing power. The cost of withstanding shocks is financial and hidden; the most dangerous scenario is the concurrence of two medium shocks in two interconnected areas; and resilience is built by distributing it across the dimensions and the areas and by fortifying society's capacity to absorb, rather than by maximising a single dimension. Taken together, these conclusions lead to the finding that the transition required is from managing shocks through improvised mobilisation to building resilience through an integrated, proactive decision, which is what the recommendations in the following chapter translate into practice.



# 6. Recommendations and Priority Directions

The eight priority actions set out below are presented as decision points ordered by their expected system-wide impact and transformative potential, rather than divided by sector. Each identifies a field in which the highest expected returns to resilience are concentrated. They have been ordered according to three criteria taken together: priority (the extent of their proximity to the binding constraint), feasibility of implementation (their financial cost and institutional complexity), and the expected impact on the system as a whole. The table below summarises this strategic ordering before each direction is set out in detail.

| # | Direction                                                           | Priority | Feasibility                 | Expected impact              |
|---|---------------------------------------------------------------------|----------|-----------------------------|------------------------------|
| 1 | Integrating water, energy and agriculture decisions                 | Highest  | Medium (sovereign decision) | Very high                    |
| 2 | Institutionalising food security and its national indicator         | Highest  | High (low cost)             | Very high                    |
| 3 | Converting the reserve into a logistical resilience standard        | High     | High                        | High                         |
| 4 | Unifying the food purchasing power system                           | High     | Medium (phased)             | High                         |
| 5 | Deepening high-value production and import substitution             | High     | Medium                      | High (growth and resilience) |
| 6 | Building farmers' capacities in irrigation efficiency               | High     | High                        | High                         |
| 7 | Fortifying the water and energy pathway against geopolitical shocks | Medium   | Medium                      | Medium to high               |
| 8 | The accompanying applied research agenda                            | Enabling | High                        | Enabling                     |

Table 8: Ordering of the recommendations by priority, feasibility and expected impact

## 6.1 Integrating water, energy, and agriculture decisions

Water, energy, and agriculture should be treated as a single system of decision rather than as parallel sectors, with the tariff structure for the Aqaba–Amman project at its core, alongside the linking of the timing of pumping to surplus renewable energy and a gradual reallocation of water from low-value to higher-value uses, combined with improved irrigation efficiency. This is the direction of highest impact, because it moves the binding constraint and turns the energy constraint from a cost burden into a source of savings. Its implementation requires joint leadership from the ministries of water, energy, and agriculture under the supervision of the Policy Delivery Unit, and a sequence that begins by building on the announced programme of water tariff reform running to 2029, then establishes the tariff formula for water supplied by the National Water Carrier before the project is completed so that the price signal is sent early, then designs a pumping mechanism linked to surplus renewable electricity, and finally undertakes the gradual, socially protected reallocation. The expected benefits are



lower water and energy costs and the reallocation of water towards uses with the highest economic return. Any transition should protect smallholder farmers through compensation mechanisms or phased implementation.

## 6.2 Institutionalising food security and launching a national indicator

Governance is the highest point of leverage at the lowest cost, and what is required is to deepen the institutionalisation of food security along two concurrent tracks. The first is to consolidate the existing institutional framework of the Higher Council for Food Security by strengthening the institutional and technical capacities of the unit serving as its secretariat and by developing mechanisms for monitoring, accountability and joint implementation among the member bodies, while activating the role of the Higher Council for Agriculture in shaping agricultural policy so as to achieve complementarity between the work of the two councils, in addition to deepening the Food Security Information System, codifying protocols for responding to shocks between bodies, and strengthening coherence among the multiple sectoral frameworks and strategies by linking them within an integrated implementation framework that connects objectives to performance indicators and to implementation plans.

The second track is to establish and launch a national food security indicator that integrates five resilience dimensions across the four thematic areas of the assessment (months of reserve coverage, the diversification of routes and suppliers, water productivity, the cost of a healthy dietary pattern and households' ability to afford it, and the maturity of institutional coordination), so that the assessment of resilience moves from a qualitative reading to a periodic indicator that tracks improvement or decline and guides the allocation of resources. The indicator would be built on the existing Food Security Information System and issued annually within the food security status report, making it an instrument of accountability and of planning at once. The expected return is a reduction in response time and in the cost of recovery, the systematic measurement and reporting of the financial cost of withstanding shocks through more systematic methodologies of measurement, and the entrenchment of repeated success in managing shocks as an institutional capacity that is measurable and repeatable through written protocols.

## 6.3 Converting the reserve into a logistical resilience standard

The strategic reserve system should be moved from a quantitative measure of coverage (a number of months) to a logistical-resilience standard encompassing diversified supply routes, distributed storage, and secondary storage facilities, in addition to the conduct of periodic stress tests of the redundancy of suppliers and routes. Increasing the stock alone does not address the risks of dependence on the Port of Aqaba as Jordan's sole maritime outlet, particularly in the light of the gaps exposed by the Bab-el-Mandeb crisis, whereas the diversification of routes and alternative corridors delivers greater security over the long term at a lower cost than raising the reserve stock alone. This direction is led by the Ministry of Industry, Trade and Supply in coordination with the Jordan General Silos and Supply Company and the Aqaba Special Economic Zone Authority, and it begins with a benchmark stress test simulating an extended closure of Aqaba in order to identify the gaps, followed by contracting for contingency arrangements for imports through Mediterranean ports together with the expansion of more efficient storage plans. The expected return is the conversion of the existing exceptional robustness into a multi-route resilience that does not collapse when one outlet is disrupted, without burdening the budget with the cost of raising the stock alone.



## 6.4 Unifying the food purchasing power system

The wheat flour subsidy, the Takaful programme, the National Aid Fund and refugee assistance should be aligned within a single instrument with shared targeting that protects the access of the most vulnerable groups at a lower cost, thereby freeing fiscal space to be returned to investment in resilience, while the trade-off between fiscal efficiency and social peace is managed in a phased manner that preserves public confidence and spares low-income households an abrupt adjustment. This calls for leadership from the Ministry of Social Development in partnership with the ministries of finance and of industry, trade and supply and with humanitarian partners, through the construction of a unified social registry linking the beneficiary databases, followed by a gradual conversion of part of the universal in-kind subsidy into targeted cash support, with a safety net protecting those wrongly excluded by targeting. The expected return is a reduction in the leakage of the benefit to those not in need and the release of fiscal space for other resilience investments, thereby strengthening purchasing power as the last line of defence.

## 6.5 Focusing on high-value products and import substitution opportunities

Investment should be concentrated in high-value, water-efficient agri-food products, namely protected horticulture, dairy, poultry, dates, olive oil and processed foods, with a clear vision for export markets and their diversification away from concentration in the Gulf. This is complemented by a targeted import substitution agenda addressing the supply gaps that can be feasibly met through domestic production identified by the Jordan Chamber of Industry, such as protein feeds and their concentrates, refined vegetable oils, semi-processed products and frozen potatoes, together with measures to address the sector's six principal challenges, in particular the adoption of the food traceability system in order to open the markets of the European Union and the United States, the reduction of the costs of energy and shipping, and the harmonisation of the advantages offered by the industrial zones. This requires a partnership between the Ministry of Investment, the Ministry of Agriculture and the chambers of industry and of commerce, through the conversion of the map of trade gaps into a portfolio of investment projects linked to targeted incentives and to concessional finance for small and medium-sized enterprises, with priority given to intermediate inputs that can be manufactured locally. The expected return is a doubling of exports towards the target of the Economic Modernisation Vision and a reduction of the import bill in the product categories where supply gaps are greatest.

## 6.6 Building farmers' capacities in irrigation efficiency and modern technologies

Making water-saving irrigation technologies available is not enough to ensure that they are used: the gap between what the crop actually requires and what is applied on the farms is a gap of knowledge and of behaviour as much as it is a technical one. What is required is a national programme of training and extension, delivered through training sessions and demonstration plots targeting farmers in the Jordan Valley and the highlands and covering the scheduling of irrigation according to the crop's water requirement, the operation and maintenance of drip systems, and greenhouses, linked to incentives that turn knowledge into practice. The expected return is that reducing over-irrigation effectively makes additional water available at a far lower cost than desalination, while raising the productivity of the cubic metre and farm income together.



## 6.7 Fortifying the water-energy pathway against geopolitical shocks

The recent shocks revealed that the energy gateway has become a channel of shock transmission to the same degree as the shipping gateway, which calls for energy security planning over a horizon of fifteen to twenty years, an expansion of battery storage to accommodate the renewable surplus, an acceleration of production from the Risha field towards the 2029 target, and the adoption of a time-of-use tariff, so as to reduce the exposure of the cost of water and of food production to geopolitical shocks and to prepare for the scenario in which shipping and energy shocks coincide rather than responding to it only after it occurs. This direction is led by the Ministry of Energy and Mineral Resources in coordination with the Ministry of Water and Irrigation and the National Electric Power Company, through the integration of the long-range energy security plan with the pumping schedule of the National Water Carrier and the acceleration of storage projects. The expected return is a reduction in the cost of generation exposed to geopolitics and the linking of water to domestic renewable energy in place of imported fuel, which severs one of the most dangerous pathways of shock transmission.

## 6.8 The accompanying applied research agenda

The recommendations are supported by an agenda of applied research that converts them into measurable options for reform. This agenda has been built in direct alignment with the priorities of the action plan of the Higher Council for Food Security 2025–2027 so that each policy paper feeds an existing initiative in the plan rather than creating a parallel track. It comprises ten proposed papers:

- The economics of pricing the Aqaba–Amman project and its effect on the agricultural tariff and on crop choice (supporting the water-efficiency and water harvesting initiatives in the plan).
- The design of a mechanism linking pumping through the National Water Carrier to surplus renewable energy (integrated with the energy and water initiatives).
- A roadmap for the reallocation of agricultural water towards high-value uses without increasing abstraction.
- A model for unifying the instruments of subsidy and transfer within a unified and targeted purchasing power system (supporting the Unified Cash Support Programme initiative).
- A stress test of the redundancy of import routes and of cereal and feed suppliers (integrated with the initiative to strengthen the strategic stock).
- A strategy of storage and diversification for feed sources matching that in place for wheat.
- An investment map for import substitution in the food industries, based on identified import and supply gaps (supporting the food-manufacturing and business-accelerator initiatives).



- An export agenda for high-value products and the diversification of markets.
- A framework for institutionalising the Higher Council for Food Security and its response protocols, and the design of the national food security indicator (supporting the initiatives on maintaining the information system and incorporating CARI and FIES).
- The updating of the data infrastructure for agriculture and food, including the livestock and greenhouse censuses and household expenditure (supporting the periodic food and health surveys initiative).

#### ◆ Rationale for the Recommendations

- *The eight directions address the linkages between the thematic areas rather than vulnerabilities in isolation, and they have been ordered by priority, feasibility and impact.*
- *The highest leverage at the lowest cost is the institutionalisation of food security and the launch of its national indicator, followed in impact by the integration of water, energy, and agriculture decisions.*



# 7. Conclusion

This study has concluded that the agriculture and food system in Jordan is not short of food; it is managing a structural exposure with a success that is striking yet unsustainable, at an implicit financial cost and under conditions that have come under mounting pressure. The central question is no longer how Jordan can produce all of its own food; it is how the country can maintain system resilience in the face of shocks that are difficult to predict and increasingly likely to coincide. Resilience, rather than self-sufficiency, is thus the foundation of food security under conditions of scarce resources, yet it does not suffice on its own: food security is realised in full when the resilience of the system is coupled with the ability of households to purchase food and with its nutritional quality.

The diagnosis has shown that water, together with energy, is the binding constraint; that trade is the stabiliser that must be fortified without remaining the sole line of defence; that production and its food industries are an opportunity to generate higher value added and import substitution rather than an instrument of self-sufficiency; that governance carries the greatest capacity for influence at the lowest cost; and that the last line of defence is the purchasing power of the household. It has also shown that these thematic areas are interdependent, a shock in one of them passing to the rest, as was demonstrated by the Bab-el-Mandeb and Red Sea crisis and by the recent regional and international conflicts, with the closure of the Strait of Hormuz and the interruption of gas supplies from the Leviathan field.

The message to policymakers is that Jordan possesses the institutions, the strategies and the partnerships capable of building resilience, and that what is required is the transition from managing shocks through improvised mobilisation to building resilience through integrated and proactive decisions that reconcile quality of life with sustainable economic growth. This study is an analytical foundation for the decisions that may be taken rather than a substitute for them, and its value is completed when its directions and its research agenda are converted into implementable and measurable options, which may be built on food security assessed not by today's strategic reserves, but by the system's capacity to withstand future shocks.



# References

The principal sources of the study are listed below, numbered independently of the numbering of the footnotes, while detailed references appear in the footnotes to the pages, coupled with an active electronic link wherever one is available; the link may be clicked to go directly to the source.

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Through its programmes in Jordan, KAS provides platforms for capacity building, knowledge exchange, and dialogue among youth, civil society actors, political parties and institutions, as well as the private sector, on framework conditions for political and economic modernisation and democratic development. The Foundation also supports research and analysis on Jordan, its role in the Middle East, and its relations with Germany and Europe.

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