



Policy Brief On Food Loss And Waste In Jordan

FoSTr Policy Brief No. 1

Key Messages

01

Food loss and waste in Jordan exacerbate existing levels of water scarcity and financial costs, threatening food and nutrition security and environmental sustainability. Food loss and waste are associated with water waste at every stage of the supply and consumption chain. A lack of comprehensive data on the amounts, causes, effects and consequences of food loss and waste hampers effective strategy development and decision-making processes to tackle such losses.

02

Analysis shows that 595,000 tons of major food products (valued at Jordanian dinar (JD) 613 million) is lost and wasted annually in Jordan, with a water impact (production loss and consumption waste) of 200.4 million m³. Significant losses occur annually in tomatoes (JD 17.99 million, 24 million m³); and animal production (JD 334.97 million, 23.98 million m³).

03

Better data on food loss and waste is needed, particularly on consumption and processing. Current estimates rely on expert analysis due to insufficient granular data. Continuous and comprehensive monitoring across the food system is essential, and requires the involvement of diverse stakeholders to ensure accurate data collection.

04

It is important to explore policies focusing on testing incentives and penalties, as well as promoting circular economy models to significantly reduce food loss and waste, and increase water conservation.

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1 Introduction

This policy brief is part of a series prepared by the Foresight for Food Systems Transformation (FoSTr) programme¹ to provide decision-makers, politicians, researchers, and practitioners with relevant data, information, policy tools and recommendations that promote a collective understanding of critical issues concerning food system transformation. The need for these notes arose from the workshops conducted by FoSTr in May and November 2023 and other relevant occasions. Stakeholders highlighted the lack of awareness, appreciation and the need to adopt a holistic and comprehensive approach to food system transformation. This policy brief is intended as a diagnostic and issues paper rather than a detailed or analytical document in order to fit the purpose.

Why the need to understand and decrease food loss and waste? About one-third of food produced globally is lost or wasted, which translates to a substantial waste of natural resources, particularly water. In Jordan, one of the most water-scarce countries in the world, the impact of water loss is even more severe. Water is embedded in every stage of the food supply chain, from irrigation to processing to transportation. Agriculture uses around 48% of available water in Jordan, and the sector is under tremendous strain from water scarcity. When food is lost or wasted, the water associated with its production is also lost, representing a significant and unnecessary depletion of the country's already limited water resources. Moreover, food waste in Jordan often ends up in landfills, which has environmental impacts in terms of pollution.

This policy brief addresses the critical issue of food loss and waste in Jordan, and its direct impact on water resources in a country already grappling with extreme water scarcity. *Food loss* refers to the reduction in food quantity or quality within the supply chain, excluding retailers, services – i.e., restaurants and hospitals – and consumers, while *food waste* occurs at the retail, services and consumer levels².

Addressing food loss and waste is essential for Jordan to improve food and nutrition security, economic resilience, and water conservation. Despite the urgency, there is a lack of comprehensive, scientifically-grounded data on the causes and effects of food loss and waste in the country – and this gap hinders the development of effective strategies to tackle such losses. This brief seeks to close the knowledge gap by analysing food loss and waste within Jordan's food system. The findings will support stakeholders in driving the national food system towards greater sustainability, efficiency, resilience, and equitability. In addition, this brief provides practical policy recommendations to effectively reduce food loss and waste.

Over the past three years, Jordan has made significant strides in prioritising food and nutrition security and transforming its food system, marking these areas as central to its developmental agenda. Its efforts are reflected in several key achievements:



Endorsement of the **Food Security Strategy and Action Plans**



Establishment of the **Food Security Council, the No Food Waste Initiative, and the Food Security Management Information System**



Development of **Food System Transformation Pathways**



Preparation of a strategic plan to improve Jordan's position in the **Global Food Security Index**



Creation of a **Food System Transformation Roadmap**

These foundational steps underscore the country's commitment to achieving sustainable, resilient, and equitable food systems.

¹ The FoSTr programme covers four countries in Africa, Asia and the Middle East. It provides Jordan with a country support facility for food systems foresight and scenario analysis. The country-led and multi-actor foresight process aims to assist stakeholders in their contributions to national food systems transformation. It supports the dialogue, analysis and understanding necessary for co-creating future food systems that are sustainable, healthy, equitable and resilient.

² Figures used in this policy brief separately calculate loss and waste, but all add up to final indications of the scale of 'food loss and waste' in Jordan.

2 Research approach

Since the end of 2022, Foresight for Food Systems Transformation (FoSTr) researchers (see note on authors at the end of this policy brief) have organized and facilitated five workshops in Jordan, engaging multiple stakeholders from the food systems community. During one of these workshops, held in Amman from May 8 to 10, 2023, stakeholders raised a research question regarding "the extent and causes of food loss and waste in Jordan's food system." In response to this inquiry, FoSTr researchers initiated a study that included an in-depth review of existing literature, data analysis, and interviews with key experts and stakeholders in the field of food loss and waste, including farmers and consumers. The statistical data for this study was primarily sourced from the Department of Statistics.

In particular, the analysis focused on understanding variations in the water footprint of crops and livestock, which are influenced by factors such as irrigation methods, soil type, weather patterns, feed composition, and management practices. These variations directly impact the outcomes related to food loss and waste, highlighting the need for targeted strategies to reduce both food waste and the associated water footprint.

3 Key findings

The study findings highlighted that a total of 302,200 tons of food is lost from local production annually, with an economic value of around JD 201 million. This loss results in a significant water usage impact of 108.5 million m³ per year. Waste from local consumption specifically, which represents total production minus exports, amounts to 293,330 tons annually, with an estimated value of JD 412.8 million. This waste contributes to a water usage impact of 91.8 million m³ per year. The total quantity of main products of food loss and waste from local production (see appendix) is 595,000 tons, valued at approximately JD 613 million.

The combined water usage due to both loss and waste of for main products of food is approximately 200.4 million m³ per year.

Specific product loss and waste:



Tomatoes are one of the most wasted food products in Jordan, with 100,590 tons wasted every year, valued at JD 17.99 million. This waste translates into a substantial production loss of JD 27.13 million, with 24 million m³ of water wasted.



Olive production experiences food losses valued at JD 16.58 million annually, with a corresponding water loss of 26.8 million m³; however, most of the olive trees are rainfed.



The water loss associated with animal production is 23.98 million m³ per year, with an economic loss of JD 98.53 million. Meat, in particular, is highly wasted, at 81,510 tons per year, valued at JD 334.97 million.



Milk waste is also significant, with 51,800 tons wasted annually, valued at JD 27.79 million.

The high annual water usage associated with tomato cultivation illustrates how the growing of specific agricultural products is linked to significant water loss when food is wasted. In animal production, the economic loss is significant, but the water impact is nuanced: most forage is imported, meaning much of the water used is from outside Jordan.

4 Policy recommendations

The findings of this study highlight the importance of addressing food losses and waste in Jordan's agri-food system. Based on these insights, the following policy recommendations are proposed:



Enhanced data collection and central coordination:

There is a critical need for ongoing, detailed data collection regarding food loss and waste across the entire food system in Jordan, particularly at the processing, retail, and consumer levels. The newly established Food Security Management Information System is a major building block in this regard, with indicators and data on food loss and waste well-integrated in the system. Key industries should collect and provide data, and research agencies should be identified to act as central data platforms, tasked with compiling and analysing this data for easy access by decision-makers. Incentivizing data-sharing and collaboration among stakeholders will be crucial to ensure data accuracy and comprehensiveness.



National pilot program for monitoring food loss and waste:

A national pilot program should be established, involving a broad range of organizations and companies tasked with tracking and monitoring food loss and waste across the food system. This program should track data at multiple points, from farm-level production and irrigation use to consumer behaviour and urban waste management. A single organization should be designated to manage and analyse the collected data, making it accessible to all relevant stakeholders. This initiative will help identify key areas for intervention and inform policy decisions.



Environmental and socio-economic approaches:

A combination of environmental, governance and socio-economic approaches is required to effectively reduce food loss and waste and conserve water resources in Jordan. Different policy tools such as financial incentives and penalties should be explored and tested by concerned agencies, in collaboration with leading private sector actors, as mechanisms to encourage companies to explore circular economy business models minimizing food loss and waste and reducing water use.



Urban feasibility studies for waste management:

Feasibility studies should be conducted by research agencies in collaboration with stakeholders – such as municipalities, catering industries, and consumer organizations – to explore effective methods for collecting, separating, and processing food waste. These studies should ensure a comprehensive approach to urban waste management.



National programme to reduce food loss and food waste:

A comprehensive national programme needs to be developed to tackle food loss and food waste, with specific actions targeting the reasons and the actors at the different levels and stages of food loss and food waste. Reducing food loss needs specific plans and actions targeting crop choice, agricultural practices, harvest and post-harvest activities, in addition to transport and storage. Reducing food waste requires specific, tailored programs aimed at consumers in general, with public awareness campaigns targeting specific groups and entities, such as housewives, school children, and restaurants and hotels.

5 Conclusion

This policy brief draws three key conclusions:

First, there is a clear urgency to address food loss and waste in Jordan's agri-food system. Despite the lack of comprehensive data, the analysis of both financial and water losses underscores the significant impact food waste has on the country's resources. Timely interventions are essential to prevent further depletion of Jordan's limited water supply and to reduce unnecessary financial losses.

Second, there is a pressing need for the renewal, update and implementation of both governmental and private policies aimed at reducing food loss and waste and water consumption. These policies should focus on promoting sustainable practices throughout the agri-food value chain, from production to consumption. Achieving this goal will require close collaboration between different stakeholders to develop tailored solutions that reflect the specific needs of each stage in the food system.

Third, addressing food and water loss and waste effectively will depend on coordinated data collection, targeted policy interventions and regulations, appropriate policy tools, and strategic planning. By enhancing data accuracy and developing targeted strategies based on evidence, Jordan can significantly accelerate its food system transformation process and improve the efficiency and sustainability of its agri-food sector.

Note about authors of this policy brief

This policy brief was written by Prof. Mohammad Majdalawi (Department of Agricultural Economics and Agribusiness), Prof. Jamal Sawwan and Prof. Muhanad Akash (Department of Horticulture and Crop Science) from the School of Agriculture, University of Jordan, under the FoSTr program. FoSTr provides Jordan with a support facility for food systems foresight and scenario analysis. This country-led, multi-actor process is designed to support the dialogue, analysis, and understanding necessary to co-create sustainable, healthy, equitable, and resilient food systems.



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IFAD/Roger Anis

Appendix 1

Table 1: The estimation of water loss and the value of the food loss and waste for main products in Jordan, 2022.

Product	Production ⁽¹⁾	Local Consumption ⁽¹⁾	Sale Price ⁽¹⁾	Footprint ⁽²⁾	Loss Estimation ⁽³⁾	Waste Estimation ⁽³⁾	The Estimation of Quantity Loss ⁽⁴⁾	The Estimation of Waste Quantity ⁽⁴⁾	The Loss of Water ⁽⁴⁾	The Loss of Water ⁽⁴⁾	The Value of Loss ⁽⁴⁾	The Value of Waste ⁽⁴⁾
	(Ton)	(Ton)	(Fils /kg)	(L/Kg)	(%)	(%)	(thousand Ton)	(Thousand Ton)	(million m ³)	(Million m ³)	(million JD)	(Million JD)
Tomatoes	606,836.7	402,353	178.8	158.7	25	25	151.71	100.59	24.08	15.96	27.13	17.99
Citrus	121,826.1	50,359	610	830	20	20	24.37	10.07	20.22	8.36	14.86	6.14
Wheat	20,858.1	20,858.10	443.8	1,100	12	10	2.50	2.09	2.75	2.29	1.11	0.93
Olives	162,661.1	160,856	1,019.50	1648	10	2	16.27	3.22	26.81	5.30	16.58	3.28
Potato	144,764.5	141,988	398	159.8	20	20	28.95	28.40	4.63	4.54	11.52	11.30
Apples	15,663.9	14,283	808.8	967	20	20	3.13	2.86	3.03	2.76	2.53	2.31
Dates	29,526.9	18,347	684.6	967	20	20	5.91	3.67	5.71	3.55	4.04	2.51
Meat	342,507.0	815,118	4,109.50	472 ^(*)	7	10	23.98	81.51	11.32	38.47	98.53	334.97
Banana	45,246.4	45,222	616.4	967	20	20	9.05	9.04	8.75	8.75	5.58	5.57
Milk	518,882.0	518,882	535.5	35 ^(*)	7	10	36.32	51.89	1.27	1.82	19.45	27.79
Total	-	-	-	-	-	-	302.18	293.33	108.56	91.80	201.34	412.79

References

- (1): DOS (Department of Statistics). (2022). Different reports. <https://dosweb.dos.gov.jo/ar/agriculture/crops-statistics/>
- (2) Mekonnen, M., & Hoekstra, A.Y. (2012). A global assessment of the water footprint of farm animal products. *Ecosystems*, 15, 401–415.
- Mourad, R., Jaafar, H.H., & Daghir, N. (2019). New estimates of water footprint for animal products in fifteen countries of the Middle East and North Africa (2010–2016). *Water Resources and Industry*, 22.
- (3) from experts
- (4): Calculations by Authors
- (*): only the local footprint is considered in the analysis



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