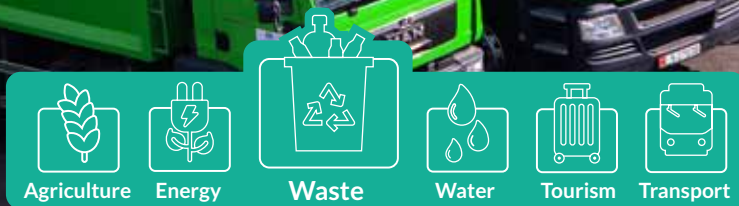




WASTE SECTOR



Green Growth National Action Plan 2021-2025



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MoEnv. "Waste Sector Green Growth National Action Plan 2021-2025," 2020. Amman, The Hashemite Kingdom of Jordan.

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His Majesty King Abdullah II Ibn Al Hussein

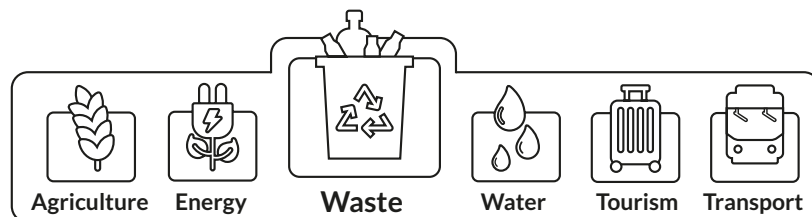
Economic leadership is by definition forward-looking. And forward-looking engagement will send a powerful message, a message of hope for my people and for yours.



WASTE SECTOR



Green Growth National Action Plan 2021-2025



Foreword by the Minister of Environment

The Ministry of Environment has been taking solid action to support Jordan's green growth transformation. In 2017, the Cabinet approved the National Green Growth Plan, which established green growth as a top national priority. Jordan's green growth vision – economic growth which is environmentally sustainable and socially inclusive – puts a strong emphasis on the importance of building resilience. This is needed for our economy to be able to absorb external shocks such as the negative consequences of COVID-19, and the ability to restore itself and continue growing.

In this context, I am proud to present the next step in implementing this vision, the Green Growth National Action Plan 2021-2025. The development of this plan lies at the heart of our continuous efforts and ambitions to support environmental and climate action in Jordan, while also achieving our sustainable economic growth objectives.

During the process of developing this plan, the Ministry of Environment has taken impressive efforts to strengthen its partnerships with the government institutions responsible for governing the six green economy sectors identified in the Jordan Vision 2025. These include: Agriculture, Energy, Waste, Water, Tourism and Transport. Through a deeply collaborative approach, we were able to identify 86 priority enabling policy actions and projects that can trigger green growth. Many of these actions are ready for the support of donors, partners, and private sector investors.

Our world is facing the most challenging economic circumstances in a century as we work to contain the COVID-19 pandemic and adapt to a new normal way of life. As for our Kingdom, I am proud to say that the government acted decisively to stop the spread of the virus, implementing measures that saved potentially thousands of lives. However, response has come at a cost, with our economy and the economic security of our citizens once again at risk.

While infrastructure investments and donor support will be critical to stabilize this risk, private sector investment in the green growth vision is equally important. In many ways, the world is already moving toward a greener future. The spread of renewable energy, electric transportation, technology that saves water and energy resources, and innovations that promote the circular economy are taking off globally. The task for Jordan is harnessing these green developments into growth and employment-creation opportunities.

I would like to express my gratitude to the Global Green Growth Institute for their partnership and technical support in the process of developing Jordan's green growth agenda. The Ministry of Environment is committed to supporting green growth implementation in the 2021-2025 period, and beyond.



Dr. Saleh Al-Kharabsheh
Minister of Environment

Acknowledgements

The Green Growth National Action Plan 2021-2025 (GG-NAP) was developed by the Ministry of Environment with the support of the Global Green Growth Institute (GGGI), under the leadership of H.E. Dr. Saleh Al Kharabsheh, Minister of Environment, and benefited significantly from the effective directions of H.E. Eng. Ahmad Al Qataneh, the Secretary General of the Ministry of Environment. Tremendous support was provided by the Technical Advisor to the Minister and Director of the Green Economy Unit, Dr. Jihad Alsawair.

Special acknowledgment goes to the sector focal points at the six key line ministries for their extensive input and coordination support throughout the development process. Appreciation also goes to the GGGI for their technical assistance throughout the project and their continued commitment to support Jordan's transition to a green economy.

The GG-NAP required a vast amount of expertise, research, consultation, and effort to complete. The finalization of the document would not have been possible without the dedication of all the individuals and organizations who worked together throughout the development process. We would like to express our deepest appreciation to those who have worked on shaping and guiding this action plan over the past two years.

Appreciation also goes to all the entities that were integral to the success of this report, as they generously provided the project team with their knowledge and expertise. These include: Prime Ministry, Ministry of Planning and International Cooperation, Ministry of Agriculture, Ministry of Energy and Mineral Resources, Ministry of Water and Irrigation, Ministry of Local Administration, Ministry of Transport, Ministry of Tourism and Antiquities, Ministry of Public Works and Housing, Ministry of Industry and Trade, Ministry of Finance, Jordan Renewable Energy and Energy Efficiency Fund, Cities and Villages Development Bank, Greater Amman Municipality, Aqaba Special Economic Zone Authority, Jordan Enterprise Development Corporation, the Jordan Chamber of Industry, Jordan Chamber of Commerce, Association of Banks in Jordan, Higher Council for Science and Technology, Royal Scientific Society, Department of Statistics, National Agriculture Research Center, Water Authority, the Jordan Valley Authority, GIZ, UNDP, NDC Partnership, EBRD, EU, AFD, FAO and World Bank.

Lastly, special thanks to the hundreds of individuals who participated in meetings, workshops, reviews, etc. for providing valuable information and feedback during the drafting process. This contribution in the interest of supporting the Government of Jordan and its green growth ambitions is sincerely appreciated.

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Contents

List of Abbreviations

ix

About the Green Growth National Action Plan 2021-2025

x

Executive Summary

xiv



3. Waste Sector Sub-Objectives and Action Selection

14

3.1 Waste Sector Green Growth Sub-Objectives 14

3.2 Translating Green Growth Priorities into Actions 16



1. A Green Growth Framework for the Waste Sector

01

- 1.1 Enhanced Natural Capital 02
- 1.2 Sustainable Economic Growth 03
- 1.3 Social Development and Poverty Reduction 04
- 1.4 Resource Efficiency 05
- 1.5 Climate Change Adaptation and Mitigation 06



4. Implementation Arrangements

19

- 4.1 Action Implementation 19
- 4.2 Future Planning and the next phase (post-2025) 23



2. Assessing Green Growth in Jordan's Waste Sector

07

- 2.1 Waste Sector Green Growth Situation Analysis 07
- 2.2 Current Waste Sector Strategic Priorities 11
- 2.3 Waste Sector Stakeholders 12



5. Waste Sector Green Growth Actions 2021-2025

24

ANNEX 1: Waste Sector Green Growth Results Framework 60

ANNEX 2: Relationship with National SW Management Strategy (MoLA) 63

List of Abbreviations

ASEZA	Aqaba Special Economic Zone Authority	MoT	Ministry of Transport
C&D	Construction and demolition	MPWH	Ministry of Public Works & Housing
CBO	Community-Based Organization	MRF	Materials recovery facilities
CVDB	Cities and Villages Development Bank	MSMEs	Micro, Small and Medium Enterprises
DOS	Department of Statistics	MSW	Municipal Solid Waste
ELVs	End-of-Life Vehicles	MSWM	Municipal Solid Waste Management
EPR	Extended Producer Responsibility	MtCO₂e	Million metric tons of CO ₂ e emissions
EU	European Union	NDC	Nationally Determined Contributions
e-waste	Electrical and electronic waste	NGO	Non-Governmental Organization
GAC	Canadian International Development Program	NSAP	National Strategy and Action Plan for Municipal Solid Waste
GAM	Greater Amman Municipality	PDTRA	Petra Development & Tourism Region Authority
GCF	Green Climate Fund	PPP	Public-private partnerships
GDP	Gross Domestic Product	PV	Photovoltaic
GG-NAP	Green Growth National Action Plan	R&D	Research and development
GGGI	Global Green Growth Institute	RoE	Return of Equity
GHG	Greenhouse gas	RSS	Royal Scientific Society
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit	SCP	Sustainable Consumption and Production
GoJ	Government of Jordan	SDGs	Sustainable Development Goals
ISWM	Integrated Solid Waste Management	SEA	Strategic Environmental Assessment
JEA	Jordan Environmental Association	SMEs	Small and medium-sized enterprises
JEDCO	Jordan Enterprise Development Corporation	SW	Solid Waste
JEF	Jordan Environment Fund	TBD	To be determined
JIC	Jordan Investment Commission	UNDP	United Nations Development Programme
MoAg	Ministry of Agriculture	UNFCCC	United Nations Framework Convention on Climate Change
M&E	Monitoring and evaluation	UNHCR	United Nations High Commissioner for Refugees
MoEnv	Ministry of Environment	UNICEF	United Nations Children's Fund
MoF	Ministry of Finance	USAID	United States Agency for International Development
MoH	Ministry of Health	WEEE	Waste from Electrical & Electronic Equipment
Mol	Ministry of Interior		
MoL	Ministry of Labor		
MOLA	Ministry of Local Administration		
MOPIC	Ministry of Planning and International Cooperation		

About the Green Growth National Action Plan 2021-2025

Jordan's primary national development strategy Jordan Vision 2025 has set high ambitions for the country's socioeconomic development in the 2015-2025 period. With this strategy, Jordan hopes to achieve an economic growth rate of 7.5% in 2025, while striving to bring the poverty and unemployment rates as low as 8% and 9.17%¹, respectively. To achieve this vision, the government has defined a set of priorities and actions based on strong private sector development and resilience to external economic shocks. While the environment and climate change are not central features in the Jordan Vision 2025, several environmental priorities are addressed, including climate change adaptation, water and energy efficiency, waste management and natural resource protection. Importantly, the document calls for the development of the green economy in six targeted sectors: Energy, Transport, Water, Waste, Agriculture and Tourism.²

Throughout 2018 and 2019, Jordan's economy experienced a steady but low growth, with real GDP at just under 2.0%. Substantial efforts have been taken to address the central government's debt, which reached 99.1% in 2019, including through introducing fiscal reforms such as the passage of the 2019 Income Tax Law.³ However, in early 2020, Jordan, like the rest of the world, was shaken by the global COVID19 pandemic. The implementation of public health measures to limit the spread of the virus brought the economy to a standstill, leaving many Jordanians worse-off.⁴ This new economic situation poses a significant risk to Jordan in the short term. With an unemployment rate of 19%⁵ at the end of 2019 and a slowdown of business-as-usual economic activity, families and small business will struggle to make

ends meet.⁶ High public debt and a likely reduction in foreign investment and tourism sector revenues will further test the long-term resilience of the economy. The economy is now estimated to shrink by about 3.5%, unemployment is expected to exceed 20%, and pressures on natural resources (particularly water) and vulnerable communities to intensify.⁷

This unprecedented set of circumstances is a serious challenge in the short term, but it presents an opportunity for the Government of Jordan to refocus its efforts on designing an economic growth approach that will foster long-term resilience. Green growth is one strategic approach that can support this effort. The Ministry of Environment began developing the Green Growth National Action Plan 2021-2025 in late 2018 as a next step toward implementation of the recommendations in the National Green Growth Plan, under the request of the Cabinet of Ministers. The GG-NAP outlines sector-level green growth frameworks and actions for the Agriculture, Energy, Tourism, Transport, Waste and Water sectors to support implementation of Jordan's green growth vision and strengthen future ability to recovery and contain shocks from catastrophic events such as COVID 19.

The Green Growth National Action Plan 2021-2025 lays out pathways for sustainable development that will increase resilience, strengthening Jordan's capacity to contain shocks and recover from catastrophic events such as COVID-19.

¹ GoJ. "Jordan 2025: A National Vision and Strategy," 2015.

² GoJ. "Jordan 2025: A National Vision and Strategy," 2015.

³ The World Bank. "Jordan's Economic Update — April 2020," 2020.

⁴ Reuters. "Many Jordanians struggling as country emerges from COVID-19 lockdown, U.N. agency says," 2020.

⁵ Department of Statistics, 2019.

⁶ UNDP. "Impact of COVID-19 on Households in Jordan," 2020.

⁷ The World Bank. "Jordan's Economic Update — April 2020," 2020.

Green growth, defined as **“Economic Growth that is environmentally sustainable and socially inclusive”**,⁸ is a multi-sector development approach that is aligned with both the 2030 Sustainable Development Agenda and Jordan’s Nationally Determined Contributions (NDC) under the Paris climate change agreement of 2015. In 2017, as a first step towards achieving green growth in Jordan, the Cabinet of Ministers

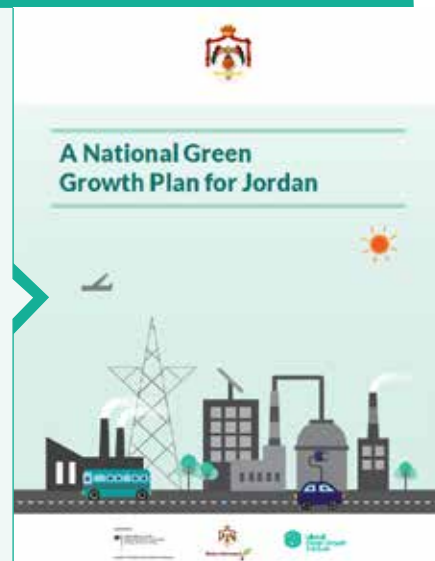
approved the report “A National Green Growth Plan for Jordan” (NGGP). Having received a special mention by the League of Arab States for being a best practice example to be replicated in the region, the NGGP assesses Jordan’s green growth potential and creates a roadmap to achieve a green economy transition in Jordan through strategic direction and recommendations (Box 1).

BOX 1

About the National Green Growth Plan for Jordan

The NGGP charts out a plan for Jordan to achieve an expanding yet sustainable and resilient economy that ensures the creation of green jobs for its citizens and increased investment in green projects. The NGGP uses a cost-benefit analysis approach to identify the challenges and opportunities for project implementation and focuses on tackling these barriers in the six green growth sectors: Agriculture, Energy, Tourism, Transport, Waste and Water. **Four driving principles of green growth are identified and mainstreamed across the actions in the Green Growth National Action Plan 2021-2025:**

- Transparent governance processes and enforcement of legislation
- Mechanisms to incentivize green growth
- Integrated planning processes that value societal impacts
- Behavior shifts and capacity building



To achieve the strategic vision laid out in the NGGP, the Ministry of Environment (MoEnv) worked in partnership with key national stakeholders to develop the **Green Growth National Action Plan 2021–2025** (GG-NAP). The GG-NAP is presented through a series of six national action plans that serve as sector-level green growth agendas. Each GG-NAP provides implementable actions to achieve the five national green growth objectives and embody the four driving

principles of green growth implementation (see Box 2). Detailed descriptions of priority policy and investment actions are included in the sector action plans, which will serve as the core of Jordan’s green growth, climate change and sustainable development agendas in the 2021 to 2025 period. Some of these are already under consideration by donors and investors. Many are included in Jordan’s NDC Action Plan and are climate finance opportunities.

⁸ Global Green Growth Institute. “GGGI’s Strategy 2030.” 2019.

BOX 2**Why the Green Growth National Action Plan 2021-2025?**

The next step towards implementing the recommendations of the National Green Growth Plan for Jordan, the Action Plan for Agriculture, Energy, Tourism, Transport, Water, and Waste sectors:

1

Elaborates and mainstreams green growth, climate change and sustainable development objectives into sectoral strategic frameworks. This will encourage formulation of greener projects, and the implementation of policies that will strengthen the enabling environment for greener investment and private sector development. These priorities are aligned with the SDGs and the NDC Action Plan⁹ as well as national sector-level priorities, which will further prepare the government to mainstream sustainable development into the post-*Jordan Vision 2025* national development plan.

2

Strengthens cross-sector collaboration. Multi-stakeholder coordination and collaboration is central to designing and implementing green growth actions, as it can maximize co-benefits. The overall development process and the actions in each sectoral plan were intentionally designed to enhance such collaboration. Such activities lead to increased awareness and behavior change among decision makers, which can further strengthen the enabling environment for future investment in green growth.

3

Emphasizes the importance of improving the enabling environment for green growth. During the initial phase of green growth implementation in Jordan, substantial focus on the enabling environment is needed. Each action description identifies the enabling actions (such as supporting technical assistance programs) required for the responsible institution to be more successful in securing investment for implementation – either from public budget, private sector investors or donors.

The development of the action plan was undertaken through a highly collaborative approach between the Ministry of Environment and the line ministries responsible for guiding each sector. Sector-level green growth focal points were established and ministerial leadership was engaged through the Higher Steering Committee for Green Economy to secure endorsement. This experience demonstrated the important and growing role the Ministry of Environment plays in facilitating action across different issue areas. The network of green growth and climate action advocates developed in recent years is a powerful tool for implementing green growth in Jordan.

The GG-NAPs were developed with technical support from the Global Green Growth Institute (GGGI), who worked with the Ministry of Environment to conduct wide-ranging stakeholder consultations in 2018 and 2019. The strategic objectives, sector sub-objectives and actions were identified and formulated through an iterative process linked as closely as possible to existing sectoral priorities. Non-government stakeholders and experts were also consulted to ensure alignment with broader sectoral priorities, and to bridge local context and international best practice.

⁹ World Bank Group. "[What a Waste 2.0](#)," 2018.

Figure 1 shows a summary of the green growth planning and implementation in Jordan.



FIGURE 1
Green Growth Planning and Implementation in Jordan

Executive Summary

The **Waste Sector Green Growth Action National Action Plan 2021-2025** (GG-NAP) outlines a green growth framework and actions for the sector aligned with the National Green Growth Plan (NGGP), Jordan Vision 2025, and Nationally Determined Contributions (NDCs) under the Paris agreement.

At the heart of the green growth approach lies the leveraging of the sector's resilience through economic growth that is environmentally sustainable and socially inclusive. The GG-NAP outlines five national green growth objectives on which the **Waste Sector GG-NAP** was developed:

1. Enhance Natural Capital
2. Sustainable Economic Growth
3. Social Development and Poverty Reduction
4. Resource Efficiency
5. Climate Change Adaptation and Mitigation

From these five national objectives, the *Waste Sector GG-NAP* identifies 14 sector sub-objectives that serve to mainstream the overarching green growth objectives into waste sector policies and investments.

In 2018, 91% of Jordan's population lived in urban areas, a historically high rate of urbanization that reflects the 'typical' challenges associated with rapid and unplanned growth, in addition to the challenges posed by the unique demands placed on services as a result of the Syrian refugee crisis. On average, Jordanians produce 0.81kg of municipal waste per capita per day,¹⁰ a rate 26% higher than counterparts in other upper-middle income countries,¹¹ with city dwellers in Jordan producing up to 50% more municipal solid waste when compared with their rural counterparts.¹² The waste situation in Jordan is a key priority green growth agenda that presents both environmental challenges and socioeconomic opportunities.

In terms of the composition of Jordan's municipal solid waste, over 50% of the waste generated by households in Jordan is food waste,¹³ and the recycling rate for

municipal waste, standing at 7%, is low, even when compared with the average of 10% across the Gulf Cooperation Council (GCC) states.¹⁴ Other types of waste, such as hazardous waste, medical waste, construction and demolition waste, and electronic waste are also generated in substantial or growing volumes in Jordan, with inadequate treatment and disposal means, as well as generally weak enforcement regimes. In terms of the environmental impact, landfilled waste is an important component of Jordan's GHG emissions profile, contributing 10% of GHG emissions¹⁵, a figure that is expected to grow as the population grows.

The waste sector illustrates the challenges and opportunities of shifting toward more resource-efficient urbanization and, ultimately, a more circular economy – chief objectives of the country's green growth agenda. For example, investing in waste segregation and behavior change campaigns, as well as fostering recycling and reuse habits, increases opportunities for the growth of micro, small, and medium enterprises. Technological innovation, the creation of incentives for investment, and an improved resource efficiency in consumption and production processes can reduce the burden on government budgets while supporting both economic growth and environmental objectives. The *Waste Sector GG-NAP* has been developed with this aim in mind, and would lead to the following transformational impacts:

- Increasing diversion of waste away from landfills, through the reduce, recycle, and reuse approach, reducing GHG emissions and urban pollution;
- Building a 'virtuous cycle': a sustainable business model which offsets the cost of waste management for urban areas;
- Encouraging private sector investment and job creation in the circular economy through innovation, market development, and public-private dialogue;
- Mainstreaming critical waste streams into sector priorities, including construction and demolition waste, e-waste and hazardous waste.

¹⁰ Statista. "Projected per capita generation of municipal solid waste worldwide in 2016 and 2050, by income group," 2018.

¹¹ GIZ. "Country Report on the Solid Waste Management in Jordan," 2014.

¹² GIZ. "Country Report on the Solid Waste Management in Jordan," 2014.

¹³ Statista. "Recycling rates worldwide in 2015, by select country," 2018.

¹⁴ GoJ. "Intended Nationally Determined Contributions (NDCs)," 2015.

¹⁵ GoJ. "Intended Nationally Determined Contributions (NDCs)," 2015.

The Ministry of Environment (MoEnv) and the Ministry of Local Administration (MOLA) worked in partnership with the support of national stakeholders and the Global Green Growth Institute (GGGI) to identify 16 priority actions to achieve green growth through the waste sector as shown in Table 1. The implementation of these actions is estimated to cost USD 248,250,000, which will require a mix of public, private sector and donor support for its implementation. The actions include:

- **7 investment preparation and demonstration actions.** These projects are at various levels of readiness: some require feasibility analysis, while others are investment-ready. Many are suitable candidates for public-private partnerships or direct private sector investment, and others are opportunities to leverage climate finance.

- **9 enabling policy and institutional reform actions.** Given the current gaps in available fiscal resources, these actions intend to attract investment by addressing policy barriers and capacity gaps that lead to higher costs, risk levels or uncertainty in decision making. These include programs to support innovation, institutional reform and coordination.

8 out of 16 of these actions contribute to the objective of Climate Change Adaptation and Mitigation, which are considered to be "Climate Action Priorities". In addition, some of them can also be found in Jordan's NDC Action Plan and forthcoming Green Climate Fund Country Programme.

TABLE 1
Summary of Jordan's Waste Sector Green Growth Action Plan 2021-2025

#	Action Title	Total Estimated Implementation Cost (USD)	Relevant Green Growth Objectives				
			Enhanced Natural Capital	Sustainable Economic Growth	Social Development and Poverty Reduction	Resource Efficiency	Climate change Mitigation and Adaptation
WS01	Review and update the National Strategy and Action Plan for Municipal Solid Waste (NSAP) 2015-2034 to integrate non-municipal solid waste and elaborate integrated waste management approaches	1,500,000		x			x
WS02	Enhance the financial management and strategic planning capacity of municipal waste management authorities	600,000		x		x	x
WS03	Introduce a policy dialogue platform for implementing extended producer responsibility in the waste sector	1,000,000		x		x	
WS04	Establish a national center for excellence on waste management and circular economy to promote innovation, training, R&D, investment and policy work	15,000,000		x		x	x
WS05	Design and implement a national behavior change campaign about circular economy and waste management	10,000,000		x		x	
WS06	Enhance the financial viability of SMEs in the waste sector through targeted business development support	5,000,000		x	x		
WS07	Conduct market assessment and feasibility study to identify potential projects and programs to divert organic waste from municipal solid waste streams	14,500,000	x	x	x	x	x
WS08	Develop and implement a Master Plan for National Hazardous Waste Management and the rehabilitation of Swaqa Hazardous Waste Landfill	35,000,000	x	x			x

WS09	Develop and implement a national policy and regulations for the management of construction and demolition waste	3,000,000		x		x	x
WS10	Implement pilot extended producer responsibility program for e-waste	33,300,000	x	x	x	x	
WS11	Implement program for waste tire disposal and reuse	22,850,000	x	x		x	x
WS12	Develop a joint public-private roadmap to transition to reduce the use of single use plastics at the household and commercial levels	3,000,000	x	x		x	
WS13	Develop a baseline study and roadmap to transition toward green jobs in the waste sector	1,000,000			x		
WS14	Establish a national upcycling hub nearby appropriate waste management infrastructure	16,500,000		x		x	
WS15	Develop municipal solid waste infrastructure to promote recycling and the use of sanitary landfills	81,000,000		x		x	
WS16	Implement a comprehensive national cleanup campaign for solid waste littering	5,000,000	x		x		x

1. A Green Growth Framework for the Waste Sector

Green growth is a new strategic approach for the Government of Jordan (GoJ) that integrates principles of inclusive, sustainable economic growth into the existing national context and priorities. Implementing this green growth approach will allow Jordan to achieve its socioeconomic development targets simultaneously addressing environmental risks and climate change – all of which are critical to achieving the Sustainable Development Goals (SDGs), as shown in Figure 2 below. At the outset of the green growth planning process, visioning exercises and consultations were held with national stakeholders through which **five national green growth objectives** were established.¹⁶ These objectives reflect Jordan's

unique institutional setup, political and economic realities, and long-term growth ambitions. National-level plans and strategies were reviewed and used as inputs to guide and shape the objectives, which were later developed into sector-level sub-objectives (see Chapter 3). The **Waste Sector Green Growth National Action Plan (GG-NAP) 2021-2025** was developed as a partnership between the MoEnv, the MOLA (with green growth focal points established within the latter) and Greater Amman Municipality (GAM), in order to ensure consistent feedback from the technical and management levels. Figure 3 shows the process for developing the waste sector GG-NAP.



FIGURE 2
Relationship between the Five National Green Growth Objectives and the Sustainable Development Goals

¹⁶ This process reflected and built on the 5 green growth outcomes proposed in the National Green Growth Plan.

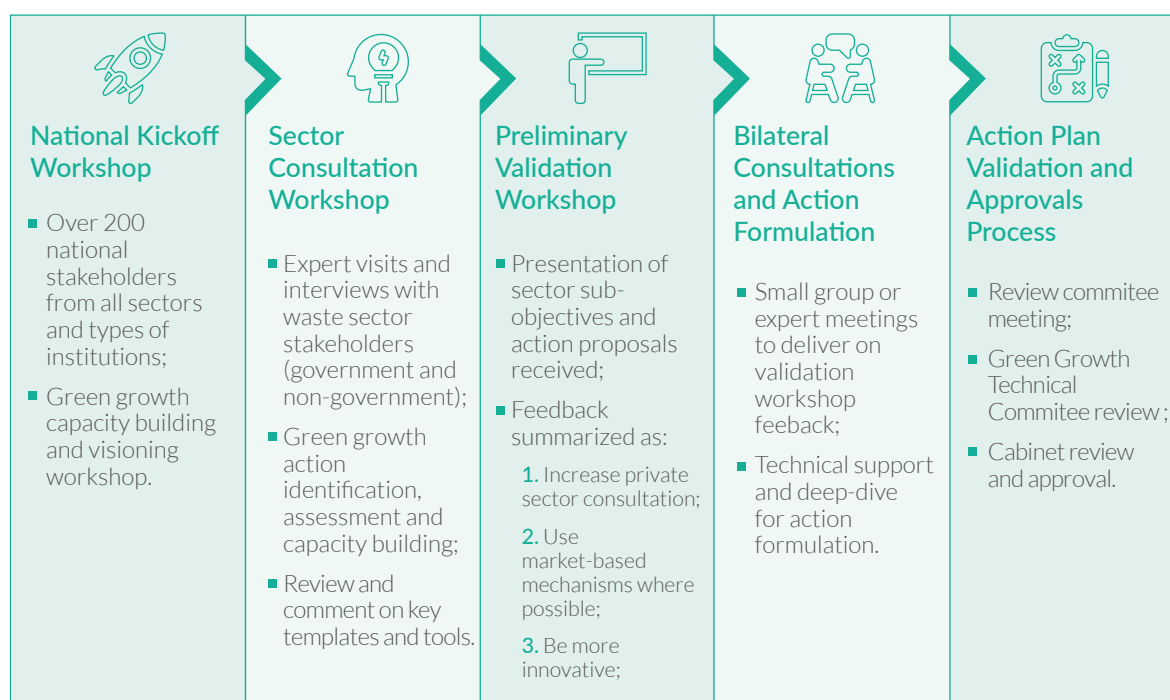


FIGURE 3
Process for Developing the Waste Sector GG-NAP.

The Waste sector in Jordan is governed by several national authorities and defined primarily by the solid waste management activities undertaken by municipalities and by the MOLA, as well as the MoEnv. This Action Plan includes priority interventions to promote the sustainable management of municipal solid waste (including organic waste), hazardous waste,¹⁷ electrical and electronic waste (e-waste), construction and demolition (C&D) waste, and other waste streams. Other important types of waste, such as wastewater (addressed in the Water sector action

plan, for example), manure and compost (addressed in the Agriculture sector action plan), and various interventions related to resource efficiency (e.g. in the hospitality sector in the Tourism sector action plan) are located in other sectoral action plans. The following sections describe the relationship between each of Jordan's national green growth objectives and this definition of the waste sector. Chapter 2 carries out an assessment of Jordan's performance against these objectives in Jordan's waste sector.

1.1 Enhanced Natural Capital

Jordan's first national green growth objective is to enhance the country's natural capital. For that purpose, it aims to improve the quality and quantity of natural resources used to generate economic growth and provide ecosystem services that support economic activities.

Natural capital is defined as the "stock of natural assets which include geology, soil, air, water, and all living things."¹⁸ These natural assets are used to generate economic growth by driving business and supporting

livelihoods. They are also used to maintain ecosystems services, such as providing clean water, soil, and air, all of which have an economic value. Unmanaged waste or pollution from industrial, commercial, agricultural, and residential sources can pose significant barriers to the preservation of natural capital. This waste can leak toxic, corrosive, reactive or otherwise dangerous substances into the soil and water bodies.¹⁹ Untreated hazardous materials, such as industrial or medical waste, can leak heavy metals (like zinc or lead) and toxic chemicals into the air, soil, and surface or

¹⁷ This includes medical waste, industrial waste and tires.

¹⁸ World Forum on Natural Capital. "What Is Natural Capital?" n.d.; and Convention on Biological Diversity. "Natural Capital," n.d.

¹⁹ Alam, Pervez, and Kafeel Ahmade. "Impact of Solid Waste on Health and the Environment." *International Journal of Sustainable Development and Green Economics* 2, no. 1 (2013): 165–68.

groundwater. Ultimately, this pollution degrades ecosystem health, adversely impacts public health and people's livelihoods, and prevents the economy from growing sustainably.

Waste, if improperly managed, can have long-term impacts on both the environment and on societies, even those far from the site of disposal. For example, it is estimated that 95% of the plastic packaging that enters the economy is discarded as waste, and 32% of this waste escapes municipal waste management.²⁰ Taken together with plastic waste stemming from fishing and ocean-based recreation, the annual volume of plastic waste dumped into the world's oceans is roughly 8 million tons. These plastics can entangle or otherwise severely damage marine life. Ingested plastics - and the chemicals contained therein - can cause generational and population-level impacts to marine life, which travel up the food chain. By consuming contaminated seafood, humans end up consuming marine plastics and related chemicals. The total cost of multi-level impacts of ecosystems degradation from plastics is estimated to be USD 2.5 trillion per year.²¹

Municipalities are responsible for covering the full costs of waste collection, and sometimes, in a few cases, the cost of disposal in small landfills. Furthermore, in some cases, municipalities also pay for waste separation at transfer stations. These duties can stretch limited financial resources to cover these costs, and distract from considering the indirect costs. While collection, separation, transport, storage, and treatment of solid waste (SW) is expensive, the environmental costs of waste management can be difficult to assess and vary substantially depending on the specific context. Cost drivers include emissions of harmful greenhouse gases GHGs (such as methane and carbon dioxide) and pollution from landfill leachate.²² Like with ocean plastics, without the proper sanitary lining, leachate seeps into the soil and water, and substances such as metals or other chemical compounds remain in the ecosystem, damaging plants, animals, and humans who come in contact with them. Ex-poste rehabilitation from landfill leachate pollution is a lengthier, more expensive process than investing in sanitary landfills.

Sustainable Development Goals: 6 (Clean Water and Sanitation), 14 (Life below Water), 15 (Life on Land)

1.2 Sustainable Economic Growth

Jordan's second national green growth objective is to ensure sustainable economic growth. In particular, the aim is to improve the enabling environment for the creation of long-term, inclusive socioeconomic development, as detailed in the Jordan Vision 2025.

Enabling sustainable economic growth requires effective management of a country's waste sector. Waste is a predictable consequence of economic growth, and, as societies develop, their waste streams become more complex. Improved technical skills, innovations, social awareness, and behavior change are required to sustainably manage this situation. Yet, many developing countries struggle with both the technical and financial burdens of waste management, with costs representing anywhere from 20 to 50% of municipal budgets globally.^{23,24} Equally important is the effectiveness of waste sector policies and incentive structures. For these policies and incentives

to work, factors like public authorities (at the national and municipal level) with strong technical capacity, effective institutional arrangements, and fluid dialogue between public-private-civil society are key.

For sustainability to be achieved, substantial financial resources (investment and revenue generation) will be needed, which will require the full engagement of private sector. The government can shift the responsibility of managing post-consumer waste to the producers and generate required revenues through the implementation of Extended Producer Responsibility (EPR) programs. According to the EPR principle, producers (including developers and manufacturers) are required to incorporate the environmental costs associated with the product's end-of-life (or its packaging) as well as reducing the impacts thereof²⁵. To implement the "polluter pays" principle, EPR programs aim to enhance the prevention, reduction, reuse,

²⁰ MacArthur, Ellen, Dominic Waughray, and Martin Stuchtey. "Rethinking Plastics, Starting with Packaging." World Economic Forum, 2016.

²¹ Beaumont, Nicola J, Margrethe Aanesen, Melanie C Austen, Tobias Börger, James R Clark, Matthew Cole, Tara Hooper, Penelope K Lindeque, Christine Pascoe, and Kayleigh J Wyles. "Global Ecological, Social and Economic Impacts of Marine Plastic." Marine Pollution Bulletin 142 (2019): 189-95.

²² Danthurebandara, Maheshi, Steven Van Passel, Dirk Nelen, Yves Tielemans, and Group Machiels. "Environmental and Socio-Economics Impacts of Landfills." In Linnaeus ECO-TECH 2012, 40-52. Kalmar, Sweden, 2013.

²³ The World Bank. "Solid Waste Management," 2019.

²⁴ Aleluia, João, and Paulo Ferrão. "Assessing the Costs of Municipal Solid Waste Treatment Technologies in Developing Asian Countries." Waste Management 69 (2017): 592-608.

²⁵ MOLA. "National Solid Waste Management strategy," 2014.

recycling, and recovery of waste. This process can lead to innovation, creating an improved ability to capitalize on waste as a resource and diversion from landfills. Well implemented EPR schemes offer businesses the opportunity to rethink their business models, such as increasing product lifespans and offering packaging buyback programs. Therefore, governments must invest in capacity building programs for Small and medium-sized enterprises (SMEs) and encourage improved waste recovery systems. A strong R&D agenda in the waste sector can also help localize resource efficient waste management.

Inadequate management of waste systems can lead to a long list of unintended economic consequences in the

medium and long terms. There are substantial indirect costs associated with poor municipal solid waste management (MSWM), since this can lead to harmful (and expensive to fix) externalities, such as illness and death of humans, contamination of waterways and soil, damage to municipal drainage systems, and high GHG emissions. The follow-on effect of these is the low quality of life to local populations, high remediation costs, and deterrence of visitors to the country (for tourism or business).

Sustainable Development Goals: 8 (Good Jobs and Economic Growth), 9 (Industry, Innovation and Infrastructure), 16 (Peace, Justice and Strong Institutions)

1.3 | Social Development and Poverty Reduction

Jordan's third national green growth objective is to achieve social development and poverty reduction. To this end, it aims to increase the equity by distributing the benefits of economic development and access to services across the society.

Social development and poverty reduction are central concepts to Jordan's long-term development agenda and are a core component of inclusive green growth. Achieving this objective requires special attention to reducing inequalities in society, unlocking access to opportunity and extending the benefits of growth to all members of society. Gender equality and women's empowerment are policy agendas that help support social development and poverty reduction, and they are a critical part of overall economic growth. A 2015 McKinsey study found that women generate only 37% of the global gross domestic product (GDP), but that closing this gap could add between USD 12 and 28 trillion to the global economy²⁶. In the Middle East and North Africa (MENA) region, women generate only 18% of GDP, suggesting greater inclusion is a major economic growth opportunity. Furthermore, access for marginalized groups and those excluded from markets, services and spaces are required for sustainable growth. Accordingly, green growth recognizes women and men with a sense of equity, and the poor and marginalized as not simply vulnerable, but as active agents of change for more sustainable growth.

The waste sector employs around 40 million workers across the world, and is therefore a significant source of livelihood, poverty reduction, and social

development.²⁷ These employees, from facilities' managers to waste pickers, are a critical component of any landfill management and recycling system. Waste pickers are particularly important to maintaining efficiency in waste systems, but workers often lack adequate protections due to high levels of informality in the sector. Studies indicate that around 1% of the urban population in developing countries (approximately 15 million people) rely on waste picking for their livelihoods.²⁸ On the other hand, what may look like junk to women may be motorcycle parts to men; what looks like dirt to men may be compost or fertilizer to women,²⁹ showing that there are underlying gender and social development issues in waste management. Although waste picking creates livelihoods for many individuals living in poverty, much of the potential for poverty reduction (through income generation) is lost due to the unstable nature of the sector. Instability is caused by fluctuating market prices for recovered materials and high levels of informality across all segments of the waste system. This informality makes reaching economies of scale very difficult, because it limits transport options and storage space for collected waste, further restricting the ability for pickers to guarantee large waste volumes and improve profits and services. Nevertheless, informal waste picking and recycling can result in positive socio-economic spillovers for men, women, and other people groups, especially in developing countries. They can reduce the amount of time and resources governments must spend on the collection, transport, and management of solid waste (SW), extending the life of SW management facilities

²⁶ McKinsey Global Institute, "How advancing women's equality can add \$12 trillion to global growth," 2015.

²⁷ ISWA, "Globalization & Waste Management," 2012.

²⁸ Medina, M. "Helping to Eliminate Poverty and Achieve Sustainable Development through Public-Private Partnerships in Infrastructure," 2008.

²⁹ Muller, Maria, and Anne Schienberg, "Gender and Urban Waste Management," 2019.

and diverting reusable materials away from landfills. Waste pickers, if empowered, may be able to transform their occupation into an avenue for substantial poverty reduction and innovation outcomes, using salvageable waste as inputs to the manufacture of products, reducing the need for imported secondary raw material³⁰.

States and municipalities play a major role in leveraging community-driven waste management, which can be achieved by changing the behavioral patterns governing waste generation in cities and urban areas. On one hand, governments have a duty to consult all communities on the location and size of waste management facilities such as transfer stations and landfills. Local Non-Governmental Organizations (NGOs) and Community-Based Organization (CBOs) can be instrumental in spreading awareness and supporting communities with knowledge and promotion of understanding, which can assist the government with making optimal investment and policy decisions. On the other hand, governments can affect behavior change by involving local communities in the entire waste value chain. For example, home composting and incentivized curbside recycling campaigns, alongside other educational and awareness initiatives, are crucial measures to stimulate a behavioral shift towards waste reduction, reuse, and recovery³¹. The government can also introduce new schemes for managing waste based on women's and men's activities and livelihoods; e.g. buying and selling household garbage, re-using and recycling waste

materials, collecting and disposing of human and SWs in a safe manner, and keeping the streets clean.³² Women in particular can play a catalytic role in shifting waste management behaviors in society.

Appropriate infrastructure and regulations must be established to improve working conditions for informal waste pickers, resulting in more secure incomes and employment benefits. Vulnerable communities and groups, not only including women and unemployed youth, but also those living under refugee status and in refugee communities, are critical populations for which the government hopes to achieve pro-poor outcomes. Transitioning to a more formal waste recycling and material recovery system provides a socio-economic opportunity to sustain landfill infrastructure, improve livelihoods of many poor and marginalized workers, and offer decent jobs for all. Hence, the work of diverting material from waste streams improves resource circularity, while simultaneously enhancing social resilience. At the same time, the government's support for the protection of labor in the waste sector, its ability to involve local communities in investment and policy decision making, and the organization of the waste management and materials markets can also cultivate successful private sector ventures, and globally contribute to the ultimate goal of achieving inclusive green growth through the waste sector.

Sustainable Development Goals: 1 (No Poverty), 4 (Quality Education) 5 (Gender Equality), 10 (Reduced Inequalities)

1.4 Resource Efficiency

Jordan's fourth national green growth objective is to achieve resource efficiency. This can be defined as improving the efficiency – reducing the wastefulness – of the economy by achieving a higher efficiency in the production and consumption of economic outputs.

A primary objective of green growth is achieving economic efficiency by internalizing externalities associated with economic growth; this is directly reliant on achieving resource use efficiency. Improving efficiency entails two elements: (1) producing the same economic output with fewer environmental inputs and lower levels of pollution, and (2) reducing the levels of pollution associated with, or embedded, in consumption. The concept of resource efficiency is closely linked to the concepts of circular economy and Sustainable

Consumption and Production (SCP). SCP has evolved as a new concept defined as “the use of services and related products which respond to basic needs and bring a better quality of life, while minimizing the use of natural resources and toxic materials, as well as the production of waste and emission of pollutants over the life cycle, so as not to jeopardize the needs of future generations.” Such definition calls both for consuming less and also consuming differently, suggesting that consumers should choose products that generate the least amount of waste when consumed, or which incorporate less material use in their production. This will inevitably lead to a reduction in waste generation rates, which has knock-on environmental impacts, and reduces the cost burden of waste management on municipalities.³³

³⁰ Wilson, David C., Costas Velis, and Chris Cheeseman. “Role of Informal Sector Recycling in Waste Management in Developing Countries.” *Habitat International* 30, no. 4 (2006): 797–808.

³¹ Environment Protection Authority. “Community Education and Awareness Strategy for Waste Management,” 2003.

³² Muller, Maria, and Anne Schienberg. “Gender and Urban Waste Management,” 2019.

³³ Environment Protection Authority. “Community Education and Awareness Strategy for Waste Management,” 2003.

Increasing resource efficiency and moving toward sustainable consumption and production requires innovation and coordination among government, manufacturers, retailers, civil society and NGOs, and citizens. In this network, governments play a critical role in fostering greater coordination towards reducing the wastefulness of consumption and production by providing an enabling environment and a reliable infrastructure as well as the design, implementation and enforcement of

fiscal instruments, policies, and incentive structures. Governments must work with the private sector to develop regulation that can discourage the use of harmful materials in manufacturing processes.

Sustainable Development Goals: 7 (Affordable and Clean Energy), 9 (Industry, Innovation and Infrastructure), 12 (Sustainable Consumption and Production)

1.5 | Climate Change Adaptation and Mitigation

Jordan's fifth national objective is to achieve climate change adaptation and mitigation, which is expressed as improving Jordan's resilience to the effects of climate change and decreasing the country's total GHG emissions. This objective is consistent with the Paris climate change targets, which is the global community's plan to respond to the global climate crisis.

Globally, the waste sector contributes with 3% of the total GHG emissions³⁴ that are aggravating climate change. Most of these come from the decomposition of organic waste in landfills (around 43% in 2010), which results in emissions of methane and carbon dioxide. Organic matter can come from many sources: it can be found mixed into the municipal waste stream from homes and commercial businesses and it can also come from waste originating in the agriculture and food production sector, including post-harvest losses and food production waste (such as slaughterhouse waste).³⁵

At the same time, the way in which waste is managed can have an impact on resilience to climate change.

Climate change increases the severity and frequency of extreme weather events, which can result in serious floods and droughts. These climate extremes lead to several socio-economic and environmental impacts, including but not limited to: increased impact on neighborhoods from dust and odor, potential damages to infrastructure and supply networks (ICT, water, sewer, etc.) resulting in more devastating environmental damages (from leachate leakage), or damage to surrounding urban infrastructure. For example, the presence of litter (uncollected municipal waste) or construction waste that has not been managed can clog stormwater drainage and create massive economic and human life losses³⁶. Increased temperatures can also elevate the risks of diseases and public health issues due to changes in the amount of leachate, odor, and dust.

Sustainable Development Goals: 7 (Affordable and Clean Energy), 11 (Sustainable Cities and Communities), 13 (Climate Action)

³⁴ Andres, Robert, Giovanni Baiocchi, William Michael Hanemann, Michael Jakob, Peter Kolp, Emilio la Rovere, Thomas Michielsen, et al. "Drivers, Trends and Mitigation." In *Climate Change 2014 Mitigation of Climate Change*, 351–412, 2015.

³⁵ Abdel-Shafy, Hussein I, and Mona S M Mansour. "Solid Waste Issue: Sources, Composition, Disposal, Recycling, and Valorization." *Egyptian Journal of Petroleum* 27, no. 4 (2018): 1275–90.

³⁶ Winne, S., L. Horrocks, N. Kent, K. Miller, C. Hoy, M Benzie, and R. Power. "Increasing the Climate Resilience of Waste Infrastructure," 2012.



2. Assessing Green Growth in Jordan's Waste Sector

2.1 | Waste Sector Green Growth Situation Analysis

Natural Capital. Jordan's natural capital is currently being threatened by gaps in its SW management system, with likely high but unspecified costs. Most of the SW generated in Jordan is disposed of in one of its 21 landfills, seven of which are closed landfills. The only landfill in Jordan that meets international best practice (being sited after a feasibility study, receiving an environmental impact assessment, and meeting international standards for design and construction) is the Al Ghabawi landfill.³⁷ Recently, the government has begun moving toward greater containment of emissions as well as application of barriers (such as linings) to prevent leakage. The MOLA is responsible for overseeing the implementation of the **National Strategy and Action Plan for Municipal Solid Waste (NSAP) Management 2015-2034**, which prioritizes mitigating against environmental degradation through rehabilitation of dumpsites, adding proper fencing, adding sanitary linings and capping them to reduce harmful emissions, and in some cases generate biogas.

Due to a lack of systems for separation and sorting of waste, the municipal waste stream sometimes contains hazardous materials. As a result, though over 50% of the content is organic, once the waste becomes mixed it takes on the properties of hazardous waste, leaving few options for value capture and re-use. The organic components of waste will eventually decompose and generate methane gas, a contributor to climate change, and other potentially volatile organic compounds (VOCs) into the air. Soil tests conducted at various landfill sites across Jordan have found exceedingly high levels of heavy metals in the leachate, posing a

contamination risk to groundwater.³⁸ Jordan's Swaqa Hazardous Waste Landfill deals with 3,000m³ to 5,000m³ of hazardous waste per year. For example, Jordan generates at least 1,000 tons of hazardous, recyclable waste annually, primarily from the production of liquid batteries by industry and battery recycling centers.

Jordan's national SW management framework law will ensure that appropriate treatment and disposal of waste is mandated, to achieve the priority of ensuring environmental and human health. Waste management in Jordan is to be founded on the principles of environmental preservation and precaution, which translates to ensuring producers and polluters to take responsibility for the treatment and disposal of waste. This progressive stance on avoidance as a first principle in managing waste in Jordan sets the scene for major reductions in adverse environmental impacts from the waste sector. Through the implementation of the requirements in the law, the government will have a strong regulatory tool to hold polluters to account, protecting economic, environmental and human health. The seepage of leachate into the ground and groundwater poses health threats to humans, animals and plants which depend on the water source. If the leachate contamination reaches water bodies such as rivers and lakes, the aquatic life is also at risk.

Sustainable Economic Growth. The growing amount and complexity of SW generated in Jordan has not been accompanied with adequate sanitation facilities and management programs. Jordan disposed of

³⁷ Aljaradin, Mohammad. "Solid Waste Management in Jordan." *International Journal of Academic Research in Business and Social Sciences* 4, no. 11 (2014).

³⁸ Abu-Daibes, Malyuba, Hani Abu Qdais, and Hatem Alsyouri. "Assessment of Heavy Metals and Organics in Municipal Solid Waste Leachates from Landfills with Different Ages in Jordan." *Journal of Environmental Protection* 04, no. 04 (2013): 344-52.

approximately 2.1 million tons of municipal solid waste (MSW)³⁹ in its landfills. Future projections show the waste volume increasing by 3-5% annually,⁴⁰ and, as the country continues to urbanize, municipal waste generation will continue to grow from the current rate of 0.9kg per person, per day.⁴¹ In addition to volume, the composition of municipal waste in Jordan is transitioning from primarily organic to a more complex mix with more plastics, paper, and cardboard, as well as e-waste. Waste composition varies across the country, but in municipalities it is broadly 51% organic, 15% plastics, and 14% paper (see Figure 1).⁴²

Managing this composition requires a substantial change from business as usual, which is an opportunity for the development of more sophisticated market activities in the waste sector. Currently, most waste sector infrastructure and services are undertaken by municipalities under the supervision of Joint Service Councils and the Ministry of Local Administration. In addition to infrastructure development, this strategy calls for the implementation of new policies and institutional structures to support the development of the waste management sector into an economic opportunity. For example, taking into account the 7% recycling rate (against the global average of 9%)⁴³, there are untapped opportunities for waste-to-resource business development. Fully capturing this economic potential and the development of successful Public-private partnerships (PPP) models is critical to enhance the private sector's investment in the waste sector, which can help reduce the burden on municipalities and open the space for innovative practices. When waste is diverted from landfills, it extends the lifespan of these waste facilities. Furthermore, it helps reduce demand for the extraction of virgin materials, with the diverted waste available serving as secondary raw materials to industries, which reduces their production costs and environmental impacts. Apart from economic benefits to the government (as landfill owners) and companies, jobs are created through the development of new material processing industries.

The private sector's current low participation rate in Jordan's SW management points to a lack of investment incentives. In 2014 and 2015, Jordan enacted the 2014 PPP Law No 31⁴⁴ as well as a revision of the Law on Municipalities No. 41⁴⁵. These laws aim to encourage

the private sector's participation in the Kingdom's economic development and provide a legislative environment for joint projects between the two sectors. To date, however, the private sector's involvement in SW management remains limited to isolated contracts for waste collection or street cleaning. Currently, there are 14 PPP initiatives (which are mostly service contracts), most of which are active and managed under the umbrella of municipalities and local authorities, each in their respective jurisdiction (i.e. Petra Development & Tourism Region Authority (PDTRA), Aqaba Special Economic Zone Authority (ASEZA), Greater Amman Municipality (GAM); Greater Zarqa Municipality, etc.).⁴⁶ Approximately 50% of all municipalities in Jordan handle their waste collection, with numerous attempts at mobilizing private investment for the construction and operation of waste treatment and disposal facilities having been unsuccessful. Between the public and private sectors in Jordan, there is a lack of understanding of how the other operates. Increased engagement is needed to promote trust and understanding, and consequently increased investment in joint PPPs in the waste sector. Private investors need to be assured of the stability and transparency of the policy and regulatory environment. The potential for private sector investment in the upgrading of waste sorting, treatment, and disposal facilities is substantial. This is consistent with the waste sector priorities set out in the Jordan Vision 2025, which include the creation of decent and rewarding jobs, as well as the private sector's involvement in the management of material recovery and the operation of complex facilities for waste treatment.⁴⁷ Inclusive governance challenges, including low awareness of circular economy concepts, management of financial and fiscal incentives structures, enforcement of waste regulations, and evidence-based decision making, need to be adequately addressed so as to mobilize private sector investments from larger companies and stimulate the growth of small and medium-sized enterprises (SMEs) in the waste sector.

Social Development and Poverty Reduction. The National Municipal Solid Waste Management Strategy 2015-34 sets targets for waste sorting at the source, including a diversion of 75% of organic waste from landfills. The strategy sets the goal of improving systems for the sorting and diversion of other recyclables, including metals, paper, plastic, and glass away from landfills. Country-wide sensitization

³⁹ UNDP Jordan. Solid Waste Value Chain Analysis of Irbid and Mahraq (2015). [Also.](#)

⁴⁰ Government of Jordan. National Municipal Solid Waste Management Strategy 2015-2034.

⁴¹ MoEnv. "Country Report on the Solid Waste Management in Jordan," 2014.

⁴² Jordan GBC and FES. "Your Guide to Waste Management in Jordan," 2016.

⁴³ PACE. "The Circularity Gap Report 2019," 2019. It is estimated that remaining national waste is openly dumped (45%) or reaches landfill (48%), indicating the enormous future potential of greater waste valorization and reuse.

⁴⁴ ILO. [Law No. 31 of 2014 concerning Public-Private Partnership.](#)

⁴⁵ Revised Law on Municipalities can be found at https://iec.jo/sites/default/files/5MunicipalitiesLaw2015EN.doc%20%281%29_0.pdf

⁴⁶ MOLA interviews.

⁴⁷ Jordan, Government of. "Jordan 2025: A National Vision and Strategy," 2015.

and participation in sorting and segregating waste serves multiple functions – educating the general public on the importance of reducing waste through household or personal spending habits, reducing the contamination of recyclable waste through adequate separation habits, and enhancing the economic value of various recyclables. In terms of social development, the younger the audience and more widespread these messages are communicated by national and community leaders, the more sustainable the system will be.

In terms of poverty reduction, waste management in Jordan engages both the formal (collection, transport, disposal) and the informal (collection, sorting, recycling) sectors. The formal sector employs roughly 6,400 people,⁴⁸ most of which are employed as waste collectors and street sweepers for municipalities. At the same time, an estimated 6,000 and 7,000^{49,50} informal waste pickers retrieve items that have resale value at the open landfills and dumpsites, functioning as the country's de facto recycling system. While this provides economic opportunities for the disadvantaged groups, there are substantial health and safety risks from sifting through waste without protective equipment. Waste pickers, particularly refugees (which make up 4% of the informal workers)⁵¹, move in and out of the sector, further challenging the regulation of the employment market. Workers are also seasonal, taking on other forms of employment when opportunities arise, such as working on farms during the harvest seasons. Recently, an improved waste picker contract has been developed to protect refugee workers in the sector, but much more remains to be done.⁵²

Integrating and supporting informal-formal sector services would reduce the volume of waste headed to landfills, create safe and decent (green) jobs, provide a ladder for SME development, and increase overall income for waste sector workers. In addition to working on landfill sites, between 6,000 and 7,000⁵³ waste pickers collect resaleable materials from street litter and direct from households.⁵⁴ Linking households, where waste is generated, to secondhand resellers or other businesses is a critical service

which can be formalized and profitable for investors. By enhancing the profitability of waste through better separation and collection systems, greater opportunities for the poor and vulnerable communities could emerge. There are a number of local-level initiatives related to composting, household education, and waste banks, but coupling them with a clear policy and vision, as well as a business development support system aligned with international best practices, such as the experience in Brazil, could create an entire new economic sub-sector with revenue generation potential and greater social development impacts for workers.

Resource Efficiency. The concept of sustainable consumption and production is new to Jordan, but more effort is needed to develop the necessary enabling environment. The Government of Jordan has committed itself to shifting away from “an old, inefficient, costly and environmentally unstable Municipal Solid Waste Management (MSWM) system towards a modern and integrated one that will be based on the Three R's approach (Reduce – Reuse – Recycle)” by 2034. This commitment is a critical first step toward a more resource efficient and circular economy, allowing Jordan to get maximum economic benefits from its scarce resources. However, to reach the government's ambitious landfill diversion targets (such as reducing the amount of bio-waste landfilled by 75% by 2024 and recovery of packaging waste by 25% by 2024),⁵⁵ much more attention is needed to create the necessary enabling environment. The creation of fiscal incentives and business development services could help encourage market development in the circular economy.

Given Jordan's lack of natural resources, its ability to harness the opportunity of waste through waste-to-resource approaches is very significant. Business opportunities exist in waste re-use and recycling. Waste reduction is also a resource efficiency and cost-savings measure which would bring about a reduction in imported raw materials. This approach is consistent but also a strong value-addition to the recent **Growth and Opportunity Strategy**, which emphasized the need to reduce imports and grow

⁴⁸ MOLA interviews.

⁴⁹ The Jordan Times. “[New work contract improves conditions of waste pickers](#),” 2018.

⁵⁰ Jordan GBC and FES. “Your Guide to Waste Management in Jordan,” 2016. Residual waste is comprised of metals, glass and mixed waste.

⁵¹ The National Solid Waste Management Strategy.

⁵² UNDP. “[New Solid Waste Recovery and Recycling Contract Improves Livelihood of Waste Pickers in Jordanian Landfills](#),” n.d.

⁵³ The Jordan Times. “[New work contract improves conditions of waste pickers](#),” 2018.

⁵⁴ More details of the activities of waste pickers and common items that are recovered for on-selling can be found in the report Solid Waste Value Chain Analysis of Irbid and Mahraq by UNDP Jordan (2015). [Also](#).

⁵⁵ Environment Agency Austria, EU. “Waste Management strategy link with SDG / National Monitoring Information system,” 2018.

export of services.⁵⁶ Organic waste is an example of how this can be achieved. 50% of MSW consists of food waste coming from diverse resources, including pre & post-harvest losses and food production waste (such as slaughterhouse waste)⁵⁷. However, uneaten food and unused food products can be composted or decomposed to generate methane as a fuel.

Public-private-civil society dialogue on the topic in Jordan is weak or non-existent. Both key pillars are currently missing, and require greater Government and stakeholder commitment. With support from development organizations and the research community, there is considerable scope for the government to engage with both the private sector and civil society on issues around waste reduction and other forms of waste management. There are also weak research-to-implementation pathways, and informality in the sector makes it difficult to establish new business models. Policies that help redefine and reshape the basic market structure are needed. Incentives that allow greater access to national and regional markets are important. Reliable destinations and markets for the recovered items are crucial to attract investment, and reliable access to materials is required as well. Other than this, recyclable materials can be recovered or diverted from landfills and fed to industries. Some household items can be repaired and remodeled for resale. However, these actions require both policy and capital investment – especially support from the private sector to address high start-up and operating (electricity) costs. A supportive policy environment is needed for national and regional markets in recycling. It should also include support for recycled materials – for example, re-visiting the current ban on recycled plastic bags, or mandating action against single-use resources, or indeed mandating for recycled content in certain products.

Climate Change Adaptation and Mitigation. GHG mitigation measures and climate change adaptation measures in the waste sector are central to the

achievement of Jordan's NDC to the United Nations Framework Convention on Climate Change (UNFCCC). The country's overall target is to reduce GHGs by 14% by 2030. Waste sector GHG emissions account for 10.6% of total emissions, 98.6% of which are the result of methane gas from managed landfills.⁵⁸ Therefore, the reduction and capture of methane gas emissions from landfills plays a significant part in Jordan's efforts to mitigate climate change effects. Efforts focused on waste prevention, recycling, and diversion of organic wastes from open landfills (at the 'upper tiers' of the waste hierarchy) are important to support these climate-related objectives.⁵⁹ To this end, the government aims to develop a system for sorting, re-using, and recycling to reduce the percentage of SW that is disposed of in landfills from 80% to 60% by 2025, as well as increasing the percentage of treated and re-used SW from 20% to 40% by 2025. The carbon footprint of waste – if accounting for collection and transport – is much higher, and improved efficiency in both the collection and transport systems can contribute to reduced GHG emissions.

Poor waste management also undermines urban climate change resilience. While water scarcity is a projected impact of climate change, an increasing intensity of rain is also expected. Poorly managed SW (especially plastic waste) is responsible for aggravating flash flooding in urban areas, by clogging drainage systems and preventing proper water drainage. An estimated 3 billion plastic bags are used each year in Jordan, amounting to approximately 500 per person. It is estimated that by 2020 this will reach a weight volume of 17.2 tons.⁶⁰ Creating circular economies around plastic waste would alleviate vulnerability to flooding, and lessen negative impacts on the environment and ecosystem. Construction and Demolition (C&D) waste is another SW stream responsible for clogging municipal drainage systems. The regulation and enforcement around C&D waste are relatively weak, but properly addressing this might reduce the intensity of impacts on urban areas in the event of extreme floods.

⁵⁶ Center for International Development, Harvard. "Jordan: The Elements of a Growth Strategy." Working Paper for the London 2019 Growth and Opportunity Summit, 2019.

⁵⁷ Abdel-Shafy, Hussein I, and Mona S M Mansour. "Solid Waste Issue: Sources, Composition, Disposal, Recycling, and Valorization." *Egyptian Journal of Petroleum* 27, no. 4 (2018): 1275–90.

⁵⁸ GoJ. Third National Communication to the UNFCCC. 2014

⁵⁹ Dominic Hogg, Ann Ballinger. "Press Kit 'The Potential Contribution of Waste Management to a Low Carbon Economy.'" Eunomia Research and Consulting for Zero Waste Europe, Bristol, UK, 2015.

⁶⁰ Saidan, Motasem N., Linah M. Ansour, and Hakam Saidan. "Management of Plastic Bags Waste: An Assessment of Scenarios in Jordan." *Journal of Chemical Technology and Metallurgy* 52, no. 1 (2017): 148–54.

2.2 | Current Waste Sector Strategic Priorities

Jordan Vision 2025. This document is the country's primary economic and social development strategy, addressing the economic, social, and governance challenges affecting Jordan's ability to transform into a more developed economy. The Vision addresses waste management in the context of the Environment sector, under which there are several targeted scenarios. This inclusion suggests that the government views waste management as a pollution prevention and public health matter. The Vision does not, however, consider waste to be a comprehensive sector, and there is no comprehensive assessment of the state of the environment in the Jordan Vision 2025 document, meaning there is still substantial room to better define the sector and identify opportunities across all production and consumption value chains to promote green growth. Key waste sector-related objectives of the **targeted scenario by 2025** include:

- Mitigating the negative effects of environmental changes on humans – including safe disposal of solid waste in landfills, development of the recycling system and proper hazardous waste management;
- Investing and creating new jobs in the green economy – including in the waste sector;
- Raising public awareness in the field of environmental protection;
- Improving institutional efficiency of enterprises operating in the environment sector;
- Private sector participation – including in the solid waste management system, recycling and reuse, as well as in the hazardous and medical waste system.

National Municipal Solid Waste Management Strategy and Action Plan 2015-2034. This strategy and action plan, whose implementation is overseen by MOLA, is Jordan's primary strategy governing MSWM. The strategy's primary aim is to mainstream the 3Rs into the management of solid waste (reduce, reuse, and recycle) and align the sector's policies and infrastructure with Jordan's sustainable development and economic growth objectives. The document proposes solutions for the management of hazardous or special solid waste streams (such as waste tires and C&D waste) but recognizes that these are to be

managed separately by the Ministry of Environment (MoEnv). The strategy divides implementation into three regions (north, central, and south), with phased approaches that introduce infrastructure upgrades, capacity building, and policy development over three time periods (short, medium, and long-term) between 2015 and 2034. The strategy is consistent with international best practice for waste sector development and lays a strong foundation to mainstream green growth into the sector. Specific objectives of the strategy include:

- Mitigation of risks on environmental and human health by MSWM through integrated management (planning, design, and operation);
- Extension of the MSW collection coverage levels to ultimately reach 100% of the population;
- Promotion of MSW prevention and reuse practices;
- Promotion of separate collection and management of special and hazardous waste;
- Promotion of sorting-at-source with view to increase MSW prevention, reuse, and recycling;
- Maximization of the use of the energy content of MSW, when viable, in order to produce energy as an alternative source;
- Establishment of appropriate MSW treatment facilities with respect to the Integrated Solid Waste Management (ISWM) hierarchy;
- Establishment of the appropriate tools for recording, analysing, monitoring, and facilitating efficient decision-making of MSWM related issues, at the national, regional, and local levels;
- Strengthening of the Jordanian MSWM sector in order to correspond to potential emergency conditions that may occur in the future;
- Integration of informal waste-pickers in the new MSWM facilities;
- Promote an effective public awareness and education on MSWM issues in the long-term;
- Promote effective capacity building activities to maintain and upgrade the MSWM system;
- Increase of MSWM system efficiency through public administration initiatives and private sector involvement;
- Increase the efficiency of infrastructure and equipment maintenance.

Jordan's existing national plans, strategies, and policy documents add a further level of specificity to its priorities, many of which are linked to green growth (see Table 2, below).

TABLE 2
Green Growth Priorities found in Existing National Documents

Relevant plans and strategies for Waste Sector	Green Growth Objectives				
	Enhanced Natural Capital	Sustainable Economic Growth	Social Development & Poverty Reduction	Resource Efficiency	Climate Change Adaptation & Mitigation
National Solid Waste Management Strategy and Action Plan		x			
Jordan Response Plan for the Syrian Crisis		x	x		
Amman Green City Action Plan (forthcoming)		x	x	x	
Sustainable Consumption and Production Strategy and Action Plan (2018-2022)				x	
Nationally Determined Contribution (NDC) and NDC Action Plan					x
Amman Climate Action Plan					x

2.3 Waste Sector Stakeholders

The definition of the “waste sector” thus far is still under legal clarification. In the current system, responsibilities are primarily divided between MOLA (and their municipal counterparts) and MoEnv. All municipal waste management infrastructure planning and investment is conducted by MOLA in close collaboration at a project level with Joint Service Councils (JSCs). JSCs are managed under the supervision of a board of mayors from each municipality within the service area. The Chief of the JSC is chosen by MOLA and can either be one of the members of the board or an external member. MOLA is responsible for seeing that the National Municipal Solid Waste Management Strategy and Action Plan 2015-2034 is implemented by both the municipalities and JSCs. Municipalities are responsible for waste collection within the municipality, as well as for the transport to transfer stations or landfills (depending on the distance of the landfill). JSCs, on the other hand, support the transport of waste over far distances,

and are responsible for the management of transfer stations and some recycling facilities. There are 18 JSCs which serve 100 municipalities across Jordan's 12 governorates.

MoEnv is responsible for ensuring the environmental sustainability of waste sector activities, and plays a major role in the development of the policy and legal frameworks governing the sector. This includes spreading awareness about recycling, reduction of waste, and reuse potential. MoEnv is also tasked with the management of hazardous waste and industrial waste, and is responsible for engaging with hazardous and industrial waste generators. MoEnv's waste directorate oversees the operations of the Swaqa Hazardous Waste Landfill, coordinates medical waste management with the Ministry of Health, and has undertaken origination activities for industrial and agricultural wastewater treatment projects, responding to their mandate to protect the environment.



Private sector associations and community-based organizations (CBOs) are actively involved in developing and delivering on recycling and reuse targets. Financial institutions such as the Cities and Villages Development Bank (CVDB), as well as the private sector, support critical investments in the waste sector. The Ministry of Planning and International Cooperation (MOPIC), as well as the Jordan Investment Commission (JIC), support resource mobilization and investment promotion for the waste sector, which are both critical to the improving sector's infrastructure and technical capacity. Waste sector priorities are being implemented, supported, and monitored by the following key stakeholder institutions:

Key Stakeholders

- Aqaba Special Economic Zone Authority (ASEZA)
- Cities and Villages Development Bank
- EDAMA
- Higher Steering Committee for Solid Waste
- Jordan Investment Community (JIC)
- Joint Service Councils
- Jordan Engineers Association (JEA)
- Jordan Environment Society (JES)
- Jordanian Green Building Council
- Ministry of Agriculture (MoAg)

- Ministry of Health (MoH)
- Ministry of Interior, Environmental Protection Directorate
- Ministry of Public Works and Housing (MPWH)
- Ministry of Planning and International Cooperation (MOPIC)
- Municipalities (including GAM)
- National Building Council (NBC)
- Petra Development and Tourism Regional Authority (PDTRA)
- Recycling companies
- Waste collectors (formal and informal)

Key Donors and Development Partners:

- Agence Française de Développement (AFD)
- Bank für Sozialwirtschaft (KfW)
- Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
- European Bank for Reconstruction and Development (EBRD)
- European Investment Bank (EIB)
- European Union (EU)
- International Finance Cooperation (IFC)
- United Nations Development Programme (UNDP)
- United States Agency for International Development (USAID)
- World Bank (WB)



3. Waste Sector Sub-Objectives and Action Selection

3.1 | Waste Sector Green Growth Sub-Objectives

Waste in Jordan, particularly municipal solid waste, is both an environmental challenge and an economic development and job creation opportunity, which is recognized in the Jordan Vision 2025 and in the [National Municipal Solid Waste Management Strategy and Action Plan 2015-2034](#). Recently, MoEnv has led the push to implement a Waste Management Framework Law, which would clarify governance responsibilities in the sector and identify a broad range of waste management activities required for the kingdom. This law covers municipal solid waste, agricultural waste, hazardous waste, industrial sector waste, medical waste, and special waste such as e-waste.

Further operationalizing the five national green growth objectives described in Chapter 1 and assessed in Chapter 2, waste sector sub-objectives for each national objective were determined. These

sub-objectives serve as a green growth-oriented waste sector agenda, which can be continually developed by national stakeholders.

Close coordination and collaborations with MOLA, MoEnv, and GAM ensured alignment with sector priorities. Special emphasis was given to establishing linkages with the country's cross-cutting environment and socio-economic strategies and plans, such as the Jordan Response Plan for the Syrian Crisis and the NDC Action Plan. Where specific green growth concepts were not prominently mainstreamed into policies and strategies, global green growth best practices were incorporated into the objective and action levels.

The five national green growth objectives are translated into 14 sector sub-objectives for Jordan's waste sector, as detailed in Table 3.

TABLE 3
Waste Sector Green Growth Sub-Objectives

National Green Growth Objective	Waste Sector Green Growth Sub-Objectives
Enhanced Natural Capital	<ul style="list-style-type: none"> a. Minimize the emission of pollutants (gaseous, liquid, and solid) through the final disposal of waste; b. Ensure adequate collection and treatment of hazardous wastes to prevent environmental contamination; c. Reduce the adverse impacts of waste and landfills on the health of ecosystems.
Sustainable Economic Growth	<ul style="list-style-type: none"> a. Support the development of SMEs and access to sustainable waste services across the full waste value chain; b. Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment; c. Promote awareness and behavior change in government, business, and society towards circular economy through the waste sector; d. Increase the government's capacity to implement evidence-based policies and incentives in the waste sector.
Social Development and Poverty Reduction	<ul style="list-style-type: none"> a. Increase the number of inclusive decent, green jobs in the waste sector; a. Enhance the rate of labor market formalization of the waste sector to enhance economic inclusion and protection of workers.
Resource Efficiency	<ul style="list-style-type: none"> a. Mainstream the concepts of reduction in waste generation, recycling, and re-use in the governance of all waste streams; b. Increase the amount of waste diverted from landfills toward recycling and re-use; c. Promote inclusive innovation in technology and processes to leverage waste-to-resource and waste-to-energy potential.
Climate Change Adaptation and Mitigation	<ul style="list-style-type: none"> a. Reduce greenhouse gas emissions from landfills and dumpsites, particularly methane gas resulting from decomposed organic matter; b. Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods).

Climate Action Priority. Climate action – policies and investments which lead to climate change adaptation and mitigation – are key priorities for the Government of Jordan. Actions which are noted to contribute to the strategic objective of Climate Change Adaptation and Mitigation represent sectoral priorities that can also be found in the NDC Action Plan and/ or the **National Adaptation Plan**⁶¹. These documents, along with the GG-NAP, guide the MoEnv in planning and implementing its international climate change commitments, for which it aims to achieve 14% overall GHG emissions reductions by 2030, including 1.5% unconditional reduction against the baseline, with a 12.5% additional reduction target being conditional upon receiving financial and technical support from international donors and development partners.



Jordan's Nationally Determined Contribution

14% GHG emissions reduction by 2030
1.5% unconditional 12.5% conditional

⁶¹ These priorities have been developed for MoEnv with the support of NDC Partnership and GIZ programs in Jordan.

3.2 Translating Green Growth Priorities into Actions

Taking into account the priorities of stakeholders, the gap analysis performed and the strategic planning exercises conducted, the a prioritized list of investments and enabling actions were identified and validated by the MoEnv, MOLA and the GGGI. Ideas were solicited through an open call for ideas with key government and non-government stakeholders. Action proposals were received and reviewed using a multi-level screening tool from which priority interventions (policies, programs and investments) were selected presented at a national preliminary validation workshop in December 2018. The findings of this workshop revealed the preference by stakeholders to prioritize those with:

- Strong links to national green growth objectives;
- High levels of innovation or novelty in concept;
- Likelihood to attract private sector investment or develop the private market.

Bilateral and small-group consultations were conducted through 2019 to prioritize and formulate the actions proposed by sector stakeholders. This process included the assessment of feasibility, risks and alignment with government priorities as per the feedback received in 2018, which improved the depth of analysis, input from private sector actors and local technical experts. The zero draft of the action plan was reviewed by an ad-hoc Waste Sector Green Growth Review Committee, hosted by MoEnv. Endorsement was received by sector leadership in the MoEnv and MOLA, and approval was received by the Cabinet of Ministers in early 2020.

For the purpose of this action plan, actions are presented in three ways: as enabling actions, as an investment, and as a combination of the two.

▪ **Enabling Actions.** These are considered to be any actions that will enable stakeholders (government and/or others) to be more prepared for future green growth policy or investment implementation. They are policy, strategy, research, and capacity building-oriented in nature. They can be implemented through a mixture of donor and government support. Donors would typically support implementation on a grant basis through technical assistance funds. Each action description contains the detailed rationale and strategic orientation which will allow Action Leads to develop funding proposals for these actions as priority green growth programs.

▪ **Investment Actions.** These are priority investment projects that support the achievement of national green growth objectives. Investments must be proven feasible from a technical, financial, and environmental standpoint. As such, they require proof of concept, a business model showing that an attractive return on investment is possible.

For enabling actions that do not lead to an investment, the estimated budget and status of financing of the action are noted in the action description in Chapter 5 of the action plan. In these cases, the “No” box is checked under the “Action Leads to Investment” section of the action description. It is important to note that some technical assistance actions may lead to investment. However, for the purposes of this action plan, all actions that do not include feasibility analysis for a specific project or investment are assumed to not lead to an investment.

Estimated Budget for this Action	
Financing Secured	<input type="checkbox"/> Yes <input type="checkbox"/> No
Potential Source of Funding	
Action Leads to Investment	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity
Estimated Investment Size	

For many green growth investments, limited feasibility analysis is available. In these cases, the action includes the development of the required analysis (feasibility studies, technical assistance, etc.) directly related to a potential or known investment opportunity. The “Estimated Budget for this Action” is noted in the action description, and the “Yes” box is checked in the “Action Leads to Investment.” In the case of investment

opportunities that have feasibility analysis completed and are considered ready for investment, the box “This action is an investment opportunity” is checked. In both cases an estimated budget for the implementation of the project/investment is given, based on the available information (such as a feasibility study, consultation with project designers, or best estimation). Table 4 shows the types of actions found in the GG-NAP 2021-2025.

TABLE 4
Types of actions found in the GG-NAP 2021-2025

Action Type	Description of Activities to be Implemented
Enabling Action	<p>Any action that will enable stakeholders (government and/or others) to be more prepared for future green growth policy or investment implementation.</p> <p>Activities, outputs, and milestones might include:</p> <ul style="list-style-type: none"> ▪ Policy analysis, recommendations, and reform ▪ Capacity building programs, public campaigns that increase awareness among a set of key stakeholders ▪ Knowledge exchange and learning ▪ Reforms to processes, procedures, and institutional setup ▪ Technical studies and analysis
Investments	<p>Any action that will lead to investment in a specific project that will support the achievement of one or more of the sector green growth sub-objectives.</p> <p>For demonstration or pilot projects, activities, outputs, and milestones might include:</p> <ul style="list-style-type: none"> ▪ Investment analysis and preparation activities ▪ Clarify the proof of concept (technical and financial aspects) of implementation of green growth projects ▪ Reform of specific policies or regulations required to attract investment ▪ Develop service models and business plans ▪ Inform replication or scale up <p>Investment-ready projects are considered ready for implementation between 2021 and 2025 based on available feasibility analysis.</p>

Action Priority Level. Actions that were considered low priority for green growth were not included in the action plan, and action descriptions were not developed. From the numerous ideas received, a limited number of detailed action descriptions were prepared and assessed according to the criteria below.

Sector review committees and green growth focal points at the relevant line ministries were asked to evaluate and validate the level of priority, and this is noted in each action form presented in Section 4.4. Table 5 shows the prioritization criteria for GG-NAP 2021-2025.

TABLE 5

Prioritization criteria for GG-NAP 2021-2025

Priority Level	Description
Low	<p>Low-priority actions are those which do not meet the adjusted criteria after the Preliminary Validation Workshop, meaning they:</p> <ul style="list-style-type: none"> ▪ Lack clear and substantial links to national green growth objectives ▪ Lack innovation and do not demonstrate added value to existing sector objectives, as outlined in national/sectoral policy documents ▪ Cannot be reasonably implemented given the available resources or capacity at the sector level in the 2021-2025 period <p><i>Low-priority actions have not been included in this action plan.</i></p>
Medium	<p>Action which:</p> <ul style="list-style-type: none"> ▪ Positively contributes to at least one of the national green growth objectives and sector sub-objectives ▪ Adds value to existing sector objectives (as outlined in national/sectoral policy documents)
High	<p>Action which meets all the “Medium” criteria, plus:</p> <ul style="list-style-type: none"> ▪ Encourages changes to the prevailing ‘business as usual’, triggering long-term, sustainable green growth transformation ▪ Impacts a large geographical area or segment of the population
Very High	<p>Action which meets all the “High” criteria, plus:</p> <ul style="list-style-type: none"> ▪ Considered a key milestone for future implementation of green growth actions, i.e., enabling actions that lead to improved and quantifiable green growth policies and investments ▪ Has strong private sector orientation, interest and/or ownership ▪ Resources have been identified for implementation (public, private, donor)



4. Implementation Arrangements

4.1 Action Implementation

Green Growth Implementation Principles. Successful implementation of this plan will require sector-level policy and institutional reform measures. The goal of these measures is to achieve:

- Greater strategic alignment and coherence among existing plans and strategies;
- Improved coordination between government institutions and stakeholders;
- More meaningful and frequent engagement of private sector, NGOs, and other non-government actors;
- Stronger investment and strategic planning systems and processes, leading to stronger return on investments made in national development and economic growth;
- Technical capacity development within government institutions.

Roles and Responsibilities. Green growth is a unique development approach that will require a high level of collaboration between national stakeholders, which has been called out as both a key challenge and opportunity in the GG-NAP. Most of the actions in this action plan require joint preparation and implementation across institutions, stakeholders, and sectors. The private sector, civil society actors, and government agencies – such as the MOLA, GAM, municipal waste management authorities, MoEnv and many more – are included as action implementation leads and support. Donors, development agencies and local NGOs are needed to provide financial support, technical expertise and knowledge of local needs and context. Table 6 shows the roles and responsibilities of various stakeholders for green growth implementation in Jordan.

TABLE 6

Roles and Responsibilities of Various Stakeholders for Green Growth Implementation in Jordan

Stakeholder	Roles and Responsibilities
Action Lead	<ul style="list-style-type: none"> Ensuring the action is successfully implemented within the planned time frame. This may include additional preparatory actions such as further consultations, resource mobilization (identifying potential donors, writing funding proposals, preparing project documents), coordinating stakeholders, and facilitating implementation (disbursing funding, etc.). Provide progress status reports as needed to the relevant focal ministry for monitoring and evaluation (M&E) purposes. For investments, the Action Lead is the project owner.
Action Support	<ul style="list-style-type: none"> Support the Action Lead by providing technical feedback, in-kind or financial support, drafting and ideation support, and other collaborations during all phases of action planning and implementation.
Sector Green Growth Focal Points at the MOLA	<p>Action Implementation</p> <ul style="list-style-type: none"> Serve as focal point for communications and reporting on sector action plan implementation progress Support action implementation by supporting Action Leads with resource mobilization, coordination, data collection, etc. Ensure the policy/regulatory environment supports action implementation (with donor support if required). <p>Mainstreaming</p> <ul style="list-style-type: none"> Support mainstreaming activities and approaches that support green growth implementation into sector-level policies and investments. Serve as technical advisor to line ministry leadership on an ad-hoc basis (especially Secretary General sitting on the Higher Steering Committee for Green Growth). Facilitate partnerships with private sector and civil society institutions to support green growth planning and implementation. <p>Monitoring/Reporting</p> <ul style="list-style-type: none"> Provide quarterly status updates on the implementation of the action plan to MoEnv, Green Economy Unit (noting any challenges and requesting any needed support).
Ministry of Environment (MoEnv)	<p>Green Economy Unit</p> <ul style="list-style-type: none"> Work closely with Action Leads to provide policy analysis (undertaking policy review, cost-benefit analysis, supporting pre-feasibility analysis, conducting consultations to change policies or regulation) as needed to support implementation. Guide Jordan's green growth planning and implementation activities and facilitating collaboration amongst all stakeholders. Support line ministries with cross-sector coordination to support project design and implementation. <p>Technical Units</p> <ul style="list-style-type: none"> Multiple directorates working on cross-cutting green growth agendas (climate change, biodiversity and natural resources, and waste regulation) support line ministries with cross-sector coordination to support project design and implementation. <p>Policies Unit</p> <ul style="list-style-type: none"> Support with resource mobilization and partnerships. <p>Higher Steering Committee for Green Economy (composed of Secretaries-General of each of the key line ministries)</p> <ul style="list-style-type: none"> Responsible for reviewing and approving a results report on a bi-annual basis, and for submitting this to the Prime Ministry. <p>Green Growth Technical Committee (composed of technical level focal points)</p> <ul style="list-style-type: none"> Responsible for supporting action plan preparation and for reviewing and addressing implementation gaps and challenges on an ad hoc basis.

Stakeholder	Roles and Responsibilities
Ministry of Planning and International Cooperation (MOPIC)	<p>Evaluation and Institutional Development Unit</p> <ul style="list-style-type: none"> ▪ Reporting against the Jordan Vision 2025 and annual Executive Development Programs, economic growth and investment planning, and sustainable development planning. ▪ Ensure mainstreaming of green growth into the next national development plan (post-2025) and other cross-cutting national plans (Jordan Response Plan, Jordan Economic Growth Plan, etc.). <p>Directorate for International Cooperation</p> <ul style="list-style-type: none"> ▪ Coordinate with donors to link national priorities (projects and programs) with development assistance (grants, loans, public-private partnerships, etc.). <p>Department of Statistics (DOS)</p> <ul style="list-style-type: none"> ▪ Collect data to report against KPIs. <p>Higher National Committee for Sustainable Development</p> <ul style="list-style-type: none"> ▪ Provide guidance and follows up on all decisions, priorities and recommendations related to the 2030 Agenda.
Prime Ministry	<p>Public-Private Partnerships Unit</p> <ul style="list-style-type: none"> ▪ Determine which actions (or which components) are suitable and priority for developing public-private partnerships. Special emphasis is given to those investments that require strong government oversight, or where ability to generate revenues is weak in the initial payback period. ▪ Review and approve of implementation progress reports. <p>Progress Unit</p> <ul style="list-style-type: none"> ▪ Review and approve of progress reports against the Executive Development Plan and other national and sector-level plans, strategies, and projects.
Ministry of Finance (MoF)	<ul style="list-style-type: none"> ▪ Determine what level of contribution the government can make to action implementation at the sector level.
Jordan Investment Commission	<ul style="list-style-type: none"> ▪ Coordinate with the line ministries to develop relevant actions into investment proposals and promote the projects to potential foreign investors. ▪ Facilitate foreign direct investment to achieve green growth implementation.
NGOs	<ul style="list-style-type: none"> ▪ Support future action formulation by providing local context and technical expertise as needed. ▪ May be responsible for implementing actions in coordination with government or private sector.
Private sector	<p>Private sector associations</p> <ul style="list-style-type: none"> ▪ Support the development of market assessments/analysis to formulate better business models or revenue models for investment actions. ▪ Participate in regular public-private dialogue to identify gaps in regulatory environment or other barriers to investment and suggest solutions. <p>Investors</p> <ul style="list-style-type: none"> ▪ Provide feedback on project proposals and potentially invest in actions by providing grants, loans, or equity finance.

Coordination. Weak coordination between stakeholders is a green growth implementation barrier affecting all sectors and threatening the sustainability of green growth interventions. This fact has been well-documented in the Jordan Vision 2025, the Jordan Economic Growth Plan 2018-2022, the National Green Growth Plan, and through the consultation process for the development of this plan. To encourage greater future coordination and collaboration between sectors and institutions (public and private) all stakeholders must commit to developing a culture of knowledge exchange, innovation, sharing, and collaboration. The government can play a leading role on the establishment of this culture through:

- Consolidating governance bodies where overlap exists, removing duplicate committees or governance units for the same issues;
- Upholding the highest standards of transparency and knowledge exchange, committing to sharing information as needed and following standard procedure for policy and project development;
- Hosting regular, inclusive sector-level donor and development partner consultations, and more frequent public-private-civil society dialogues on key policies and investments;
- Conducting more public outreach and awareness of government successes and lessons learned.

Financing Implementation. An estimated budget for implementation of each action is included in each action description in Chapter 5. This estimate is considered a starting point for detailed action planning. In some cases, implementation can be achieved at a lower cost, while others can be bundled with other programs/initiatives. The specific components of these programs and projects will likely differ during implementation. Line ministries implementing sectoral action plans are responsible for identifying the financial resources required for green growth action implementation, including using public budget where available and with sector donors. As implementation facilitators, MoEnv and MOPIC will support identification of off-budget resources for implementation to support SDG achievement and NDC implementation.

Official development assistance and climate finance are two sources of international finance that can be applied to green growth implementation. While technical assistance programs and demonstration/pilot projects may be easily financed by donors on a grant basis, investment in projects is a more resource intensive process. Infrastructure projects typically require substantial up-front costs, which tend to be financed with debt under long payback periods. Consequently, most of these investments will be owned either by the government or large institutional investors or a mixture of ownership

through PPP. These will require cost-benefit-analysis and investment planning in advance of implementation. Project implementers will work directly with MoF to ensure that the necessary investment conditions can be reached.

Capacity building and Institutional Development.

The mainstreaming of green growth planning and implementation at the sector level will require continuous learning through capacity building and institutional development. The green growth analysis, objectives, implementation actions and results framework can be strategically mainstreamed at the sector level during sectoral planning exercises. Continuous development of the concept and its ramifications on sectoral development is needed for technical- and management-level government staff. MoEnv will aim to play an increasing role in supporting capacity building and institutional development with its partner ministries in the area of green growth and climate change.

Monitoring and Evaluation. Several donor-funded actions are included in the action plan, each with specific logic models and corresponding performance indicators as part of standard donor requirements. These will refer to and align with the overall results framework for the GG-NAP. Whenever possible, common indicators will be used to increase alignment and reporting schedules will be synchronized with the GoJ's fiscal year. Ongoing monitoring of the performance of individual sector actions will be the responsibility of the line ministry for the sector, as below, in coordination with the identified action "owner". Sector leads and the appropriate Action Leads will communicate any issues uncovered as part of their ongoing performance monitoring with MoEnv's Green Economy Unit.

Implementation Tracking. Implementation will be tracked jointly by the Green Economy Unit at the MoEnv, the relevant monitoring focal point at the sector ministerial level, and the Evaluation and Institutional Development Unit at MOPIC. Key roles and responsibilities of all stakeholders responsible for pushing implementation are outlined below. Efforts will be taken within the first year to ensure sector-level commitment to implementation. MOPIC and MoEnv will work with action leads to ensure sufficient access to financial and technical assistance for implementation.

Communications. MoEnv will work to ensure effective communication across government institutions about the status of implementation of the GG-NAP. Projects that contribute to green growth will be entered into the Green Growth Tracking System developed by MoEnv, and the Ministry commits to ensuring regular updates on implementation.



4.2 | Future Planning and the next phase (post-2025)

Sectoral Planning. Sector decision makers at the relevant line ministry and the MoEnv will seek to continuously support green growth mainstreaming at the sector level. This means using the objectives outlined in the action plan to guide implementation of sectoral policies and investments. Further, MoEnv will work with MOPIC to continuously seek to find and feature green growth actions under implementation in Jordan. Many existing or future actions that do not appear in the GG-NAP can still be considered green growth actions, and their impacts will be accounted for in green growth reporting. Lessons learned from these projects and programs will be compiled and reflected into the design of future projects and programs.

Phase II Green Growth Action Planning. Action planning in the next phase will be less complex given

the experience of developing this first action plan. The preparations for this shall begin in the fourth quarter of 2024, with ample time for consultation and review of lessons learned in Phase I. The implementation period for Phase II is expected to be 2026-2030, and, as such, will be closely aligned with the Sustainable Development (2030) Agenda and the NDC. Green growth action planning for Phase II can also be aligned with the next long-term national development plan developed by MOPIC, the follow-up to the Jordan Vision 2025. For this process, MoEnv and MOPIC will work together to undertake consultations at the sector level, provide capacity building and strategic visioning workshops, and support green growth action ideation and formulation. Advance consultation with donors to the extent possible, and identification of public budget for green growth implementation, is needed.



5. Waste Sector Green Growth Actions 2021-2025

The following 16 priority actions have been identified for implementation in the 2021-2025 period. These interventions are estimated to cost USD 248,250,000, and include:

- **7 investment preparation and demonstration actions.** These projects are at various levels of readiness: some require feasibility analysis, while others are investment-ready. Many are suitable candidates for PPP or direct private sector investment, and others are opportunities to leverage climate finance.

- **9 enabling policy and institutional reform actions.**

Given current gaps in available fiscal resources, these actions intend to attract investment by addressing policy barriers and capacity gaps that lead to higher costs, risk levels or uncertainty in decision making. These include programs to support innovation, institutional reform and coordination.

Implementation of these actions will contribute to the Waste Sector Green Growth Sub-Objective as well as in:

- Increasing diversion of waste away from landfills, through the reduce, recycle and reuse approach.
- Building a 'virtuous cycle' a sustainable business model which offsets the cost on waste management for urban areas.
- Encouraging private sector investment and job creation in the circular economy through innovation, market development and public-private dialogue.
- Mainstreaming critical waste streams into sector priorities, including construction and demolition waste, e-waste, hazardous waste.

Table 7 shows the agriculture sector green growth actions and can be used by action owners to begin project proposal formulation for the purpose of mobilizing public budget or external grants, loans or other financial support for implementation. It is understood that detailed implementation approach, outputs, timeline, budget, and stakeholders may change depending on the source of finance during the process of implementation.

TABLE 7
Waste Sector Green Growth Actions 2021-2025

#	Action Title	Page #	Total Estimated Implementation Cost (USD)	Relevant Green Growth Objectives				
				Enhanced Natural Capital	Sustainable Economic Growth	Social Development and Poverty Reduction	Resource Efficiency	Climate change Mitigation and Adaptation
WS01	Review and update the National Strategy and Action Plan for Municipal Solid Waste (NSAP) 2015-2034 to integrate non-municipal solid waste and elaborate integrated waste management approaches	26	1,500,000		x			x
WS02	Enhance the financial management and strategic planning capacity of municipal waste management authorities	28	600,000		x		x	x
WS03	Introduce a policy dialogue platform for implementing extended producer responsibility in the waste sector	30	1,000,000		x		x	
WS04	Establish a national center for excellence on waste management and circular economy to promote innovation, training, R&D, investment and policy work	32	15,000,000		x		x	x
WS05	Design and implement a national awareness campaign about circular economy and waste management	34	10,000,000		x		x	
WS06	Enhance the financial viability of SMEs in the waste sector through targeted business development support	36	5,000,000		x	x		
WS07	Conduct market assessment and feasibility study to identify potential projects and programs to divert organic waste from municipal solid waste streams	38	14,500,00	x	x	x	x	x
WS08	Develop and implement a Master Plan for National Hazardous Waste Management and the rehabilitation of Swaqa Hazardous Waste Landfill	41	35,000,000	x	x			x
WS09	Develop and implement a national policy and regulations for the management construction and demolition waste	43	3,000,000		x		x	x
WS10	Implement a pilot extended producer responsibility program for e-waste	45	33,300,00	x	x	x	x	
WS11	Implement program for waste tire disposal and reuse	47	22,850,00	x	x		x	x
WS12	Develop a joint public-private roadmap to transition to reduce the use of single use plastics at the household and commercial levels	49	3,000,000	x	x		x	
WS13	Develop a baseline study and roadmap to transition toward green jobs in the waste sector	51	1,000,000			x		
WS14	Establish a national upcycling hub nearby appropriate waste management infrastructure	53	16,500,000		x		x	
WS15	Develop municipal solid waste infrastructure to promote recycling and the use of sanitary landfills	55	81,000,000		x		x	
WS16	Implement a comprehensive national cleanup campaign for solid waste littering	58	5,000,000	x		x		x

WS01

Review and update National Strategy and Action Plan for Municipal Solid Waste (NSAP) Management 2015-2034 to integrate non- Municipal Solid Waste and elaborate integrated waste management approaches

Description
<p>The current situation that combines high rates of waste generation with limited disposal options results in over 90% of all waste landing up in unsanitary landfills and dumpsites across the country. Waste leachate is not captured and ends up seeping into the soil, contaminating the groundwater. Uncovered landfills also harbor pests that spread diseases, posing threats to public health and general wellbeing. As the population grows, waste generation is expected to increase by 3% per annum, including MSW and hazardous waste. As of 2020, the Parliament has made progress toward ratifying the Waste Management Framework Law. The Law would substantially reform the ways in which waste is managed across the kingdom, enabling the government to clarify and strengthen the national waste management approach and implementation framework, while also embedding the concepts of waste avoidance, sorting at source, circular economy, sustainable consumption and production, and, ultimately, green growth. NSAP 2015-2034 does not address the management of non-municipal waste streams and does not identify or address serious coordination gaps between government and non-government stakeholders in the waste management sector.</p> <p>The purpose of this action is to bring together the various stakeholders across the waste value chain of the primary SW streams, to set targets for their management, and explore avenues for increased efficiency and collaboration. By law, MOLA is responsible for overseeing the implementation of its strategy, but with the ratification of the Framework Law, and considering that MOLA will update its strategy soon, it will be increasingly important for MoEnv and other key stakeholders to join in comprehensive waste management planning and implementation. This action will result in the update of policies and strategies related to specific SW streams which are not considered MSW through a comprehensive national strategy to deal with these.</p>

Action Objectives	<ul style="list-style-type: none"> Undertake a strategic environmental assessment (SEA) for 2015-2034 NSAP. Undertake a review and update of the NSAP, which should: <ul style="list-style-type: none"> Address and incorporate the recommendations from the SEA prepared for the strategy; Mainstream Jordan's green growth objectives for the waste sector; Following participatory approaches, develop and incorporate an addendum to the strategy targeting the management of other non MSW streams; Improve coordination on waste management across public and private sector entities.
Implementation Milestones	<ul style="list-style-type: none"> Establishment of a national multi-stakeholder steering committee on waste management involving the private sector, NGOs, academia, and government, made operational to contribute to the development of SEA and to support the design and implementation of the new strategy and vision. Undertaking of SEA for the NSAP, which should also deliver: <ul style="list-style-type: none"> Development of a stakeholders' analysis and engagement plan, following participatory approaches; Brief description of current baseline conditions related to waste management in Jordan, including municipal and non-municipal waste; Building a geo-database of all waste transfer and disposal facilities with geo-fencing showing the coverage of service areas for each municipality and service council; Comprehensive analysis of anticipated strategic environmental, social, and economic impacts from NSAP. One set of recommendations for the revision and updating of NSAP 2015-2034. One set of recommendations on capacity development. Establishment of a sectoral communication and collaboration framework. One waste sector policy, planning, and implementation agenda to compliment the implementation of the National MSWM Strategy and Action Plan. This, specifically, would cover hazardous waste and other special waste streams not covered in the MOLA's strategy. One National Waste Management Law translated into a national vision and strategy for comprehensive waste management, incorporating various waste streams that require attention.

Implementation Milestones	<ul style="list-style-type: none"> ▪ One roadmap developed towards achieving a vision for holistic municipal and non-municipal waste management, establishing clear roles for various key stakeholders as well as timelines for achieving milestones. ▪ Scheduling of regular meetings to update on progress and challenges, as well as provision of a platform for collaboration and discussion of new opportunities.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Increase the government's capacity to implement evidence-based policies and incentives in the waste sector. ▪ Climate change adaptation and mitigation: Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods).

Estimated Implementation Period	
Start Year – 2021	End Year – 2023

Location(s)	Countrywide	Other key partners	Government of Germany, USAID, EU, Private investors, Development partners, NGOs, Jordan Environmental Association (JEA)
Implementing Stakeholders	Lead MOLA Support MoEnv, MPWH, Ministry of Health (MoH), Ministry of Agriculture (MoAg), Ministry of Industry and Trade & Supply, Ministry of Interior (MoI)	Estimated Budget for this Action	USD 1,500,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5
<ul style="list-style-type: none"> ▪ MOLA intends to update its strategy on a rolling basis (roughly every 5 years) and is already considering how it can and should be updated. 							

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Multiple forms of stakeholder engagement to be employed in order to obtain adequate stakeholder inputs and acceptance of the strategy and roadmap. ▪ Document and publicize the benefits of an effective and comprehensive waste management strategy, to secure financing for its implementation. ▪ Mainstream SEA as an effective environmental and social safeguard tool, as well as an effective tool for informed planning and decision making at the policy, strategy, and program levels.
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WS02 | Enhance the financial management and strategic planning capacity of municipal waste management authorities

Description
<p>While collection rates for municipal waste are high across Jordan, there is inadequate management of all waste streams, which limits the services' sustainability. Generally, waste management authorities lack regular sorting-at-source programs. Segregation at source has an immense potential in reducing the costs of waste management across municipalities. Municipal staff are responsible for developing plans, incentive schemes and programs, ensuring proper enforcement of regulations and improving public awareness.</p> <p>One of the greatest challenges for MSWM is sustainability of finance, due in large part to very low-cost recovery rates for municipalities. This must be addressed to ensure there are enough resources to provide waste services. The need for capacity development to improve cost recovery through effective tariff setting and collection, as well as planning and coordination for financially viable waste management, was highlighted in the United Nations Environment Programme (UNEP) report of 2011. Enhancing the technical capacity of public officials in waste management enables them to better oversee and plan for the infrastructure requirements necessary to keep up with waste volumes and types. Through this action, the capacity of waste management municipal teams will be enhanced, to enable effective operations and maintenance of the waste collection, management, and disposal processes, as well as infrastructure. Furthermore, municipal teams will also be trained to design and manage PPPs for the provision and operation of key infrastructure for waste management.</p> <p>This action will also support the ongoing joint initiative between the MoEnv and DOS, with support from the EU, for the development of the National Monitoring Information System for MSW, which will collect and share data on MSW across the country, providing an evidence base for tariff setting and policy planning.</p>

Action Objectives	<ul style="list-style-type: none"> ▪ Improve capacity among municipalities to plan and operate local waste management services, including the capacity to enable effective PPPs for the provision and operation of key infrastructure for waste management. ▪ Improve information management and sharing mechanisms across sector. ▪ Enhance coverage, quality, and range of municipal waste services across the country. ▪ Reduce the costs of waste management and collection on municipalities and stimulate cost recovery. ▪ Increase the volume and percentage of SW diverted from landfills.
Implementation Milestones	<ul style="list-style-type: none"> ▪ Conduction of training on financial and operational aspects of waste collection services in the municipalities for municipal officials. This includes the following sub-milestones: <ul style="list-style-type: none"> ▪ Completion of one training needs assessment study to guide the development of the training program. ▪ Compilation of technical inputs, with substantial collaboration from in-house experts to ensure the training provided is relevant to the Jordanian context. ▪ Training program developed, institutionalized, and implemented to address the training needs previously identified. This should include, but is not necessarily limited to, training on development and implementation of strategic plans, SEA, business models, and on managing and engaging with informal and formal SMEs in waste management facilities. ▪ Establishment of unit on financial management in the municipal waste system with the CVDB. ▪ Establishment of a facility to finance projects, improving the environmental performance of the waste value chain. ▪ Formalization of collaborative links between SMEs providing waste segregation and material reuse services.

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Increase the government's capacity to implement evidence-based policies and incentives in the waste sector. ▪ Resource efficiency: Increase the amount of waste diverted from landfills toward recycling and re-use. ▪ Climate change adaptation and mitigation: Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods).
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Estimated Implementation Period	
Start Year – 2022	End Year – 2024

Location(s)	Irbid, to be expanded to other municipalities	Other key partners	Global Affairs Canada, Federation of Canadian Municipalities
Implementing Stakeholders	Lead MOLA Support Private sector companies, financial institutions including CVDB, MoEnv, CBOs	Estimated Budget for this Action	USD 600,000 which can be distributed as follow: <ul style="list-style-type: none"> ▪ USD 150,000 – Consultancy fees to undertake a training needs assessment, to develop complete training contents and train the first batch of local trainers, as well as to develop a set of recommendations for programme sustainability and institutionalization; ▪ USD 150,000 – Local training costs (to be co-financed with participating municipalities); ▪ USD 200,000 – Initial support costs for SMEs to develop the required reporting systems to take on government contracts; ▪ USD 100,000 to support the establishment of Unit on financial management in the municipal waste system and of the Facility to finance projects.

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	-
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5
<ul style="list-style-type: none"> ▪ A program to improve the capacity of municipal authorities is currently under implementation by the Federation of Canadian Municipalities (with the support of Canada) from which lessons can be learned. 							

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Develop a training program in discussion with interested municipalities to ensure relevance and appropriateness of training (scope and level). ▪ Encourage co-financing of training from municipalities to promote financial sustainability of the program.
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WS03 | Introduce a policy dialogue platform for implementing extended producer responsibility in the waste sector

Description
<p>While the need for waste producers to shoulder the responsibility for treatment and disposal is covered in the new strategy, there is no institutional mechanism to implement such a requirement. This dialogue platform brings the enforcers of the new law together with the affected companies to ensure compliance and collaboration. The dialogue platform would enable the government to enhance EPR knowledge transfer and exchange with major producers of waste to develop innovative and cost-effective solutions to the problem of increasing SW's volume. This dialogue platform aims to achieve 2 direct outcomes:</p> <ul style="list-style-type: none"> ▪ Collaborative effort between the government and private sector to ensure compliance with the EPR clause in the new Law, requiring major polluters to bear responsibility for appropriate containment and disposal of waste. ▪ Introduction of global best practices in EPR/Corporate social responsibility (CSR), such as packaging buyback, repair workshops, post-consumer item reuse, etc., contextualized to the opportunities and requirements of the Jordanian regulatory environment. <p>It also provides a co-benefit: encouraging companies to develop products with less packaging and more reusable materials and parts, hence reducing the burden on waste management further downstream. Through continually improving standards of waste minimization, the EPR requirements can be expanded over time, saving costs on waste management. An association has been established, and international companies have agreed to implement the ERP system on a voluntary basis, including Nestle, Dow, Pepsi, Coca-Cola, Proctor and Gamble, among others.</p>

Action Objectives	<ul style="list-style-type: none"> ▪ Improve understanding of the opportunities and challenges of operationalizing EPR within the Jordanian context. ▪ Enhance and maintain dialogue and coordination between private and public sectors for the development of a pathway towards EPR implementation. ▪ Enhance knowledge of EPR operationalization and benefits in Jordan among public and private sector.
Implementation Milestones	<ul style="list-style-type: none"> ▪ Establishment of an EPR Implementation Task Force, with formal involvement of major commercial waste generators, beginning with international companies. ▪ Carry out a study on the potentials, impact and implication for businesses of EPR's implementation as per current regulations completed. This study should identify and address gaps in the EPR system, proposed under the National SW Law currently under review in Parliament. It should also include a comprehensive geo-database of all major waste producers, as well as the characteristics of waste produced by those producers. ▪ Open and transparent dialogue initiated and maintained between national waste management authorities and large waste generators (local and international) on the topic of EPR. ▪ Piloting of EPR schemes with major waste producers, demonstrating global best practices with required localization in waste collection/buyback schemes, material sorting and reuse, waste treatment and disposal. ▪ Compilation of guidance notes to enable replication of EPR schemes. ▪ EPR awareness program developed and implemented. ▪ Adoption of regulations and policies developed by the task force and negotiated with the stakeholders, in preparation for EPR's country-wide implementation by 2025.

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Promote awareness and behavior change in the government, businesses, and society towards circular economy through the waste sector. ▪ Resource efficiency: Mainstream the concepts of reduction in waste generation, recycling, and re-use in the governance of all waste streams.
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Estimated Implementation Period	
Start Year – 2021	End Year – 2024

Location(s)	Countrywide	Other key partners	Business networks, associations
Implementing Stakeholders	<p>Lead MoEnv, Ministry of Industry, Trade and Supply (joint leadership)</p> <p>Support Private sector companies, Research institutions, MOLA, GAM and ASEZA</p>	Estimated Budget for this Action	<p>Total of USD 1,000,000 disaggregated as follow:</p> <ul style="list-style-type: none"> ▪ USD 300,000 for the study of potentials, impacts, and implications from EPR on businesses, including the development of a comprehensive geo-database on major waste producers and waste characteristics across Jordan; ▪ USD 100,000 for the establishment of a Task Force, meetings and for the implementation of the dialogue; ▪ USD 200,000 for the development and implementation of an awareness programme and materials; ▪ USD 400,000 for piloting/demonstrating EPR schemes with selected major waste producers.

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	GIZ, EU
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5
<ul style="list-style-type: none"> ▪ Extensive efforts are ongoing with Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), in partnership with the MoEnv, to engage the industry in discussions on the topic of EPR, and a stronger understanding of the challenges and opportunities is emerging. 							

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Widely communicate EPR good practices and their respective benefits (economical, environmental, and social), including providing technical support for companies planning to implement EPR practices. ▪ Engage with businesses with the understanding that EPR will be increasingly required as a policy approach, with the possibility of introducing incentives to early adopters, encouraging companies to adopt EPR policies. ▪ Engage other related governmental stakeholders, including the Ministry of Trade and Industries, the Investment Commission, ASEZA, GAM, etc., to ensure incorporation of all related outcomes in respective national policies and programmes, and to gain support to EPR.
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WS04 | Establish a national center for excellence on waste management and circular economy to promote innovation, training, R&D, investment and policy work

Description
<p>The waste sector has been supported through numerous development projects and other external technical inputs. However, there is no dedicated institution promoting R&D, or the integration of innovation to the waste sector. Particularly, as the waste stream becomes increasingly complex, the waste sector needs to leverage existing and new technologies to manage waste materials to ensure environmental impact is kept to a minimum.</p> <p>This institution will be led by key research institutions in the country (i.e. universities, Royal Scientific Society (RSS), etc.) with proper level of governmental support, to help stimulate the sector's transformation. It can further serve as a disseminator of knowledge, through training courses, webinars, and other information-exchange platforms, with the potential to catalyze technical collaborations between the public and private sector. Prior to the establishment of such a center, a sector-wide dialogue should be launched as to set the institutionalization process of the proposed sector while identifying potential members/partners. This can also be promoted as a business opportunity if such a center is accredited from an international accreditation body thus to provide training within the region (Middle East and North Africa).</p>

Action Objectives	<ul style="list-style-type: none"> Enhance continuity in waste management knowledge. Improve access to waste data and applicable technologies. Encourage and support innovation, and introduce locally relevant technological solutions for waste management.
Implementation Milestones	<ul style="list-style-type: none"> A 'one-stop shop' independent advocacy body established and operationalized to conduct research and provide recommendations for developing more robust recycling and circular economy programs in the waste sector. Establishment of research programs on waste management technology within the advocacy body, and in collaboration with key universities and research institutions in Jordan. Research findings and technologies advertised on government, industry, and university websites to promote their application. Establishment of a comprehensive database on waste management, with data compiled consistently across governorates and shared openly. Development of collaborations with the industry (public and private) to explore the reuse and recycling of materials in waste to resource applications. Development of curricula on waste management for university students, to incorporate best international practices and to promote innovation. One road map for sustainability and business development, in order to maintain and grow the 'one-stop shop' independent advocacy body.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> Economic growth and sustainability: Increase the government's capacity to implement evidence-based policies and incentives in the waste sector. Resource efficiency: Promote innovation in technology and processes to leverage waste-to-resource and waste-to-energy potential. Climate change adaptation and mitigation: Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods).

Estimated Implementation Period	
Start Year — 2023	End Year — 2025

Location(s)	Amman	Other key partners	International organizations and accreditation authorities, donors
Implementing Stakeholders	Lead RSS, Universities, Research Institutions Support Ministry of Industry and Trade & Supply, MOLA, NGOs, Ministry of Higher Education & Scientific Research, Ministry of Planning & International Cooperation	Estimated Budget for this Action	USD 5,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	USD 10,000,000 (Assuming over a period of five years, following action implementation. Investments are expected from the private sector's demand for consultancy and training services, from research funding and from selling the services of accredited regional training programs).

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> Regularly disseminate research findings and industry collaborations to relevant ministries, in order to inform the policy making process. Communicate research achievements and potential for enhancement of waste management, including job creation and SME development, to stimulate donor and investor funding for wider applications. Development of a business development and sustainability plan, along with a marketing plan to ensure sustainability and growth of the established advocacy body, as well as to raise funds for innovation research.
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WS05 | Design and implement a national behavior change campaign about circular economy and waste management

Description
<p>The main priorities of the waste strategy comprise improving the system responsible for the transfer and disposal of waste in Central and Northern governorates, enhancing the well-being and socio-economic status of informal waste pickers at dumpsites, and raising the general public's awareness on issues related to SW management. The strategy also highlights the needs for revisiting existing reuse, recycling, recovery, and landfill diversion targets so as to facilitate the shift towards a lifecycle-oriented circular economy, which aims to incorporate all residual waste in a closed-loop system, bringing the waste output close to zero.</p> <p>There are several aspects of the current waste management processes that are untenable. First and foremost is the lack of systematic waste sorting and recycling. With the growing population, Jordan's waste volumes are set to increase. Current landfills and dumpsites are unable to accommodate growing amounts of waste each year. This will inevitably result in the proliferation of unofficial dumpsites or on an increase of illegal dumping, mostly around urban areas where most of the waste is generated. Uncontained, unmanaged waste results in environmental pollution, degrades the living environment and gives rise to significant public health risks. Other challenges in the waste sector, such as the lack of sanitary landfills and waste treatment facilities, further exacerbate pollution from waste disposal. The government intends to mitigate the waste sector's environmental impact through the development of a system for sorting, reusing, and recycling of waste. One key step towards this goal is raising awareness and engaging the general public in waste sorting at the source. In addition, other initiatives such as banning plastic bags and other solutions that are implemented at the citizen level in similar countries and economic contexts, can be explored.</p> <p>The purpose of this action is to increase awareness among different social groups about the need to address individual waste management behaviors, including waste separation at the source. Targets for these efforts will be transversal to all parts of society, including within schools and universities, corporations, the public sector, and in major social areas such as malls, markets, restaurants, etc. The need for increasing public officials' capacity for effective collection, treatment, and disposal of waste is balanced by the importance of sensitizing the public to the need for waste reduction and prohibition of littering and illegal dumping.</p>

Action Objectives	<ul style="list-style-type: none"> ▪ Stimulate and promote Jordanians' behavioral change with respect to responsible waste generation and handling (waste reduction, source sorting, and prohibiting littering) through outreach and social marketing. ▪ Promote the culture of waste separation at the source, facilitate recycling and composting, and eventually accomplish a reduction of the volume of waste sent to landfills in multiple Jordanian neighborhoods with different socio-economic characteristics.
Implementation Milestones	<ul style="list-style-type: none"> ▪ Social marketing program developed and launched across conventional and social media covering issues including waste minimization, waste segregation, recycling, and the role individuals play in sustainable waste management. This milestone should include the implementation of an: Annual Waste Campaign, to be conducted in schools, shopping malls, markets, government offices, etc., aiming to engage the civil society in waste reduction, sorting/recycling, and proper disposal. ▪ Development and introduction of a school and university student's awareness-raising program on domestic waste management, to be implemented at public and private schools. ▪ Corporate commitments to promote circularity in commercial processes obtained and monitored. ▪ Infrastructure for waste segregation at source and for improved handling of waste is developed and provided in at least 50 social hubs (universities, schools, hospitals, markets, etc.) across all governorates in the kingdom. ▪ Annual monitoring and evaluation report to gauge progress against set targets.

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability – Promote awareness and behavior change in government, business, and society towards circular economy through the waste sector. ▪ Resource efficiency – Increase the amount of waste diverted from landfills toward recycling and re-use.
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Estimated Implementation Period	
Start Year – 2021	End Year – 2024

Location(s)	Countrywide	Other key partners	Ministry of Education, Ministry of Industry and Trade & Supply
Implementing Stakeholders	Lead MoEnv, MoLA, GAM, ASEZA, PDTRA Support Ministry of Health, environmental NGOs	Estimated Budget for this Action	USD 10,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Ensure campaign messaging is consistent and factually sound by launching a campaign within the public sector to first gauge appropriateness of content. ▪ Promote campaign messages across diverse settings to ensure that waste management information reaches as wide an audience as possible and is not only focused on a select group of recipients.
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WS06 | Enhance the financial viability of SMEs in the waste sector through targeted business development support

Description	
	<p>Large scale private sector involvement in waste management is minimal, limited to sporadic waste collection and public cleaning contracts. However, the waste sector provides the means of livelihoods to thousands of people across the Kingdom. Informal waste collectors are often economically vulnerable, consisting largely of women, youths, and refugees. The waste sector provides an easy entry into the economy, with little entry requirements. However, work conditions are often unsanitary and open to exploitation, as the waste pickers are unable to set the prices for materials retrieved from the waste streams. Through providing onsite and offsite capacity support by health-care organizations (i.e. The United Nations Children's Fund (UNICEF), the United Nations High Commissioner for Refugees (UNHCR), etc.) for waste pickers and small companies engaged in waste collection or recycling to develop viable business models that are sustainable, stable jobs can be created within the waste sector, to provide adequate livelihoods for the vulnerable populations. These capacity building programs – among other measures targeted at enhancing the waste sorting infrastructure – would render waste pickers and waste sorting individuals aware of the loss of livelihood risks engendered by an increasing trend of waste segregation at source. In other words, those individuals would become more adaptable to any changes in the waste value chain and might accordingly consider repositioning their role at a different chain hub. In addition, mechanisms should be established for regular dialogue with policymakers for the vulnerable groups to provide inputs to the development of labor policies and working condition standards, in compliance with international best practices, specifically concerning the waste sector. Key relevant facts:</p> <ul style="list-style-type: none"> ▪ There are 13 licensed, large companies that transport waste to landfills; ▪ According to a 2009 USAID study, the plastic market was worth USD 300mn, while now is estimated to be worth over USD 500mn; ▪ There are around 300-400 plastic crushers, approximately 40 of which are licensed and registered with MoEnv. Some of these crushers are also found in the industrial processes for plastics production; ▪ There are more than 30 companies licensed for managing manure/agricultural waste (transporters, transfer station operations, and treatment); ▪ There are many opportunities in specific sub-sectors or waste streams.
Action Objectives	
	<ul style="list-style-type: none"> ▪ Improve understanding of SMEs in the waste sector across Jordan to support informed decision making. ▪ Strengthen awareness and capacity among informal waste workers and Ministry of Micro, Small and Medium Enterprises (MSMEs) to improve the occupational health and safety conditions in which they work. ▪ Enhance the financial capacity of both individuals and SMEs in the waste sector to enable sustainable livelihoods.
Implementation Milestones	
	<ul style="list-style-type: none"> ▪ One geodatabase and assessment report produced. ▪ Mapping and assessment of SMEs active in the waste sector, including formal and informal actors, for their current status and economic viability. ▪ A comprehensive program implemented to build the capacity of informal waste pickers and employees in MSMEs processing waste materials, including: <ul style="list-style-type: none"> ▪ One outreach program implemented for raising health and safety issues around waste handling among informal waste pickers and workers in MSMEs. ▪ One advocacy group formed to allow individuals working informally in the waste sector to easily access consultations, trainings, and information dissemination. ▪ One jointly operated service center by MoEnv and MoF (PPP unit) established for attracting private sector investments in the waste sector. ▪ One business development support program to support individual and MSME financial management established and maintained through training, mentoring, and business development grants for MSMEs willing to scale up improved business models and create green job opportunities. ▪ One report about the impact of sector formalization on MSMEs, business development potential, and the state of competitiveness of SMEs in the waste sector (formal and informal).

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Support the development of SMEs and access to sustainable waste services across the full waste value chain. ▪ Social development and poverty reduction: Enhance the rate of the waste sector's labor market formalization to enhance economic inclusion and protection of workers.
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Estimated Implementation Period	
Start Year – 2022	End Year – 2025

Location(s)	Countrywide	Other key partners	MoEnv, CBOs, UNICEF, UNHCR
Implementing Stakeholders	Lead Jordan Enterprise Development Corporation (JEDCO) Support Ministry of Labor (MoL), MOLA, Municipalities, Ministry of Social Development, Ministry of Youth, MoH, Ministry of Industry, Trade and Supply, MoF, NGOs	Estimated Budget for this Action	USD 5,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5
<ul style="list-style-type: none"> ▪ JEDCO has extensive experience in supporting SMEs to develop business models and enhance their financial viability; additional technical assistance will be needed to build the business case for waste sector service companies. 							

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Due to the seasonal and informal nature of waste picking work, it is important to keep outreach efforts ongoing, in order to engage and register participants for trainings and information sessions, with word of mouth publicity as a key form of information dissemination. ▪ Expectations of SMEs and informal waste workers of the program need to be managed through clearly communicating the program's offerings. ▪ Strong links to the green jobs action and the national center of excellence should be maintained.
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WS07 | Conduct market assessment and feasibility study to identify potential projects and programs to divert organic waste from Municipal Solid Waste streams

Description
<p>“Wet” organic waste is a major contributor to landfill based GHG emissions and is a serious problem for private sector development in Jordan’s waste sector. Organic waste decomposes in uncovered landfills, resulting in methane emissions which are responsible for over 10% of Jordan’s GHG emissions. Food waste from restaurants, hotels, or from the residential sector makes up the vast majority of municipal solid waste’s composition in landfills across the Kingdom, and is considered to be 50-65% of the total generated waste.⁶² Wet waste is considered a contaminant when mixed in with dry waste, making potentially recyclable waste more difficult and expensive to separate and sell, which makes the business model for recycling less attractive to potential investors. At the same time, there are several potential uses for the separated organic material, including the production of compost and fertilizer. This can be produced on a small scale in homes or on farms, or potentially collected and processed at large scale as an investment opportunity with triple bottom line impacts (environmental, economic and social).</p> <p>In addition to food waste entering the municipal solid waste stream, agricultural waste continues to be an environmental challenge. It is estimated that 1,662,650 tons of wet manure are produced every year from cow, chicken, and sheep farms every year. The cost of managing this waste is very high, and improper disposal can lead to long-term environmental impacts, including unsanitary conditions for communities living nearby.</p> <p>Until organic waste can effectively be removed from the municipal waste streams, it can be captured in landfills as a circular economy solution. Waste collection services cover large areas of the Kingdom – 90% of urban and 70% of rural areas, respectively. After collection, vehicles transport the waste to landfills and dumpsites. Currently, there are 21 official waste disposal sites within the boundaries of the Kingdom. Of these, only one is an engineered sanitary landfill with only two engineered landfills, while most of the other ones suffer from equipment and infrastructure (namely fencing) shortages. Al Ghabawi landfill, the country’s first engineered sanitary landfill, sets a role model for the future rehabilitation of existing landfills. The landfill’s design and construction comprises a gas collection system that enables the plant to transform waste to energy, which will eventually displace energy generated by fossil fuels. The Al-Russaifah Biogas Waste to Energy project has been operational since 2000, and the GAM is evaluating the possibility of expanding and rehabilitating the project. With this project, waste can be captured and used as a source for power generation. The recycling benefits from this project are varied, but energy savings have been shown to range from 24-95% and air pollution could drop as much as 20-95%.</p> <p>For recycling to be profitable, the best solution is the reduction of organic waste (through behavior change at both the company and individual level) and the implementation of separation at source programs, to divert wet material from the municipal solid waste stream. For example, in GAM, in areas such as Wadi Seer, Zahran, and Bader, waste is sorted into paper, plastics, glass and other categories, and re-used. However, this sorted waste would be given a higher market value if it was clean (without food or other organic waste on it). The policy framework will support the recycling, re-use or up-cycling of materials currently disposed of in the waste stream. As organic waste comprises a large part of the MSW stream, a feasibility study should be carried out to determine whether a business case for the conversion of municipal organic waste to commercial fertilizer can be made.</p>

Action Objectives

- Enhance the circularity of waste management through increased material reuse, hence reducing the volume of waste heading to the landfills.
- Promote the application of innovative technologies to improve the sustainability of waste management.

⁶² Jordan GBC and FES. “Your Guide to Waste Management in Jordan,” 2016.

Implementation Milestones	<ul style="list-style-type: none"> ▪ Identification of organic waste hotspots from the industrial biowaste and commercial sectors (hotels and restaurants). ▪ One assessment report of residential food waste behaviors in major urban areas. The purpose of this study is to provide updated information to decision makers about the culture and behaviors related to consumer behavior and disposal techniques and gaps. ▪ One assessment/evaluation of the conditions of landfills, with focus on the technical and financial potential of waste-to-energy and waste-to-resources projects. This milestone should also contemplate the completion of one final assessment report, covering information on types of waste materials, locations within the country and required technology for recycling/reuse. ▪ Commenced industry engagement to identify potential areas for industrial symbiosis. <ul style="list-style-type: none"> ▪ Final report published, including recommendations on priority sites for waste to resources projects and waste to energy projects. Report to include appropriate technology, estimate costing, business case for each project, and list of challenges. ▪ Policy guidelines promoting waste-to-resources and waste-to-energy interventions at various scales drafted and adopted. ▪ Feasibility study on the conversion of organic waste to fertilizer conducted. This should include: <ul style="list-style-type: none"> ▪ Market assessment; ▪ Life-cycle assessment of food waste; ▪ Reuse options assessment based on cost-benefit analysis and identification of green growth co-benefits; ▪ Policy recommendations for how to implement best approaches. ▪ Link to R&D/innovation action (WS04) to incorporate local R&D into the solution to the extent possible, by having at least two pilot projects - one in Irbid and one in Amman - and at least six research projects undertaken within the framework of this action. ▪ Roadmap for PPP investments and business development.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment. ▪ Social development and poverty reduction: Increase number of decent, green jobs in the waste sector. ▪ Natural capital: Minimize the emission of pollutants (gaseous, liquid, and solid) through the final disposal of waste. ▪ Resource efficiency: Promote innovation in technology and processes to leverage waste to resource and waste to energy potential. ▪ Climate change adaptation and mitigation: Reduce greenhouse gas emissions from landfills and dumpsites, particularly methane gas resulting from decomposed organic matter.

Estimated Implementation Period	
<i>Start Year</i> – 2022	<i>End Year</i> – 2025

Location(s)	Countrywide	Other key partners	MoEnv, MoAg, international donors
Implementing Stakeholders	Lead MOLA, GAM Support JIC, Ministry of Energy and Mineral Resources, Ministry of Trade and Industry and Supply, Jordan Chamber of Commerce (JCC), Business groups, Private sector investors/ Financial institutions.	Estimated Budget for this Action	USD 4,500,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	USD 10,000,000 within the five years following action implementation for the establishment of PPP investments.

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Step-wise, costed investment plans can be prepared for incremental implementation as and when funding becomes available. ▪ Financial projections based on projects completed in other countries will be regularly revised to reflect the financial markets, so that investors have a clearer picture of real cost and return on investment periods.
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WS08 | Develop and implement a Master Plan for National Hazardous Waste Management and the rehabilitation of Swaqa Hazardous Waste Landfill

Description
<p>The Swaqa landfill is the only authorized landfill for disposal of hazardous waste, and is located 120 Km South East of Amman. The site utilizes 500 hectares of fenced area for receiving and storing a variety of waste streams, primarily originating from private sector generators. Existing facilities include storage structures, a number of lined basic landfill cells, and evaporation lagoons. Currently, piles of hazardous waste are stored at the landfill in open spaces due to infrastructural constraints, such as the absence of treatment facilities. The facility receives between 5,000-10,000 tons of hazardous waste per year. The accumulation of waste on-site is accelerating the need for a site clean-up, and the installation of new hazardous waste handling technologies. Adequate handling of hazardous waste reduces air pollution and prevents soil and water bodies from being contaminated by toxic substances. Institutional and individual capacity building will lead to a reduced generation of hazardous waste, as a start. The site currently faces technical and administrative challenges related to the storage, handling, and management of waste due to a lack of much needed proper equipment and trained personnel. In recent years, events such as spontaneous fires caused by chemical reactions, as well as chemical contamination carried by rain, have occurred. Informal waste pickers sometimes enter the landfill site to scavenge through the uncovered waste. These events contribute to the spread of the hazardous waste to the surroundings of the landfill site, posing significant risks to both public health and the environment.</p>

Action Objectives	<ul style="list-style-type: none"> ▪ Increase individual and institutional capacity to manage hazardous waste. ▪ Improve understanding of the needs to achieve efficient and environmentally sound management of hazardous waste and to mitigate its impacts, including: ▪ Improve air and water quality and soil health, especially within the immediate vicinity of Swaqa Landfill site. ▪ Remediate contaminated soil and water around landfill site through the implementation of advanced sorting techniques and the installation of biological and physical treatment systems. ▪ Reduce the impact of waste on the environment to minimum levels. ▪ Comply with national and international standards relevant to transporting, receiving, handling, storing, and treating of hazardous waste. ▪ Execute the requirements established by international agreements [Basel Agreement, Rotterdam Agreement, Stockholm Agreement (POPs), and Minamata Agreement (Mercury)].
Implementation Milestones	<ul style="list-style-type: none"> ▪ One training program on adequate handling, containment, treatment, and disposal of hazardous waste conducted for all personnel regulating, supervising, and operating the Swaqa Landfill (including staff at the MoEnv, as well as other concerned entities like ASEZA and GAM), including the introduction of a consistent and transparent logging system for recording all waste processed at the landfill site. ▪ An effective and efficient mechanism for remediating the existing site implemented, including: <ul style="list-style-type: none"> ▪ Conduction of a site remediation assessment, to determine the extent of contamination and the required measures, time frame, and costs associated. ▪ One set of recommendations and designs for Effective and efficient mechanism for remediating the existing Swaqa Hazardous Waste implemented. ▪ One draft of a nationwide comprehensive hazardous waste management master plan (can be included as part of the National Solid Waste Strategy in WS01), considering that: <ul style="list-style-type: none"> ▪ Policies and guidelines on rehabilitation of areas contaminated by hazardous waste are drafted and adopted. ▪ Policies and guidelines on hazardous waste handling, temporary storage, transport, and record keeping are drafted and adopted. ▪ Development of a framework for outreach and communication for public and private stakeholders, which shall also include information management and sharing protocols. ▪ Development of individual and institutional capacity to safely treat and manage major forms of hazardous waste and operate the landfill sustainably. ▪ One nationwide comprehensive hazardous waste management master plan. ▪ A feasibility analysis for the implementation of the master plan, including an investigation of possible funding opportunities. ▪ A strategic environmental assessment (SEA) for the master plan.

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment. ▪ Natural capital: Ensure adequate collection and treatment of hazardous wastes to prevent environmental contamination. ▪ Climate change adaptation and mitigation: Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods).
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Estimated Implementation Period	
Start Year – 2021	End Year – 2023

Location(s)	Swaqaa Hazardous Waste Site (120 km South East of Amman and 50 Km East of Amman-Aqaba Highway)	Other key partners	Potential financiers: Green Climate Fund (GCF), GIZ (funded capacity building related to hazardous waste and capacity building in the landfill)
Implementing Stakeholders	Lead MoEnv Support Pharmaceuticals and chemical industries, other companies/industries generating hazardous waste, MoH, Ministry of Industry and Trade & Supply	Estimated Budget for this Action	USD 3,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No (Funding for the rehabilitation of Swaqa site is in the pipeline from International Finance Corporation (IFC) and GIZ, hence additional funding is needed for the master plan and other action milestones)	Potential Source of Funding	Public funding through Jordan Environment Fund (JEF) / Climate finance is initially identified as possible co-funding source.
Action leads to investment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	USD 32,000,000 Estimated based on the budget needed to implement the proposed mitigation and management measures, including the measures to increase the quality of infrastructures aimed for managing hazardous wastes (adequately protecting the environment from impacts of leachate or harmful residues). It will also increase MoEnv's preparedness to systematically address hazardous waste issues in Jordan, and allow on-site managers to more safely manage different waste streams.

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Communicate the environmental and social benefits of the project, together with comprehensive maintenance and operations plan, to investors and donors in order to mobilize the required investments. ▪ Develop legislative framework governing the rehabilitation of landfills and surroundings to facilitate the allocation of public funds towards the project.
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WS09 | Develop and implement a national policy and regulations for the management of construction and demolition waste

Description
<p>Construction continues to be a key component of Jordan's economic base. However, regulations around the disposal of C&D waste are poorly enforced. It is often less expensive for companies to dump the waste in unpoliced open spaces than to pay for transporting waste to an official landfill. Furthermore, many authorities and organizations (i.e. MPWH, MoL, JEA, etc.) are responsible for enforcing regulations related to the final disposal and management of C&D waste, sometimes leading to the duplication of efforts and/or overlapping of responsibilities. This governance gap makes it difficult to decide who should be responsible for the formulation of C&D waste management-related policies and regulations. C&D waste consist largely of crushed concrete, steel, wood, and other building materials. Most of these materials are durable and do not biodegrade in a short time. From an alternative perspective, many of these materials are reusable as construction materials after processing. Steel, timber, and other reusable elements in discarded C&D waste are systematically recovered by waste pickers and sold on to secondhand retailers.</p> <p>The Strategy recognizes the shortage of regulations governing the management of C&D waste and guidelines to oversee the responsibilities of stakeholders involved therein. In addition, the new Strategy recommends setting recovery targets for C&D waste, including backfilling. The introduction of regulations around the management and disposal of C&D waste provides clear messaging to companies that the most economical avenue for waste disposal is not through illegal dumping. Apart from the fines and penalties that accompany illegal dumping, companies can be further encouraged to divert C&D waste from landfills through subsidy support to process such materials for reuse in construction, saving costs of raw materials and for waste disposal.</p> <p>The reuse of C&D waste requires changes in current construction practices. This may lead to changes in building design requirements, which have wider implications for the industry. Additionally, recovery and reuse of C&D waste has to consider other C&D streams, such as those flowing from abandoned and existing stone cursing sites and mines. Through the management of C&D waste, the opportunity could arise for the building industry to adopt more sustainable practices, improving the wellbeing and comfort of building users. The appropriate management of C&D waste brings environmental benefits such as preventing blockages of drains and elimination of C+D dumpsites, but it also brings economic benefits in the reduction of raw materials and demolition costs.</p>

Action Objectives	<ul style="list-style-type: none"> ▪ Improve the policy and regulatory environment guiding the management of C&D waste. ▪ Improve private sector and industrial waste management stewardship through awareness and identification of investment opportunities. ▪ Identify potential economic opportunities to produce clean construction materials locally, and better techniques to reduce waste generation.
Implementation Milestones	<ul style="list-style-type: none"> ▪ Building an expert steering group consisting of all relevant stakeholders from the private and public sector as well as civil society organizations, established to develop road map towards low waste construction industry in Jordan. <ul style="list-style-type: none"> ▪ Group to investigate eliminating hazardous materials currently used in construction. ▪ Technical review of feasibility of various waste reduction strategies conducted for Jordan – pre-fabricated building elements, modular construction, reduction of material packaging, among others. ▪ Policy and regulations for management of C+D waste drafted and adopted. ▪ Strategic environmental assessment of proposed new policies and regulations conducted. ▪ One technical committee established to train SMEs on waste processing for reuse, as well as monitor waste diversion rates and financial outcomes for construction companies (as a result of C+D waste reuse), which should include: the conduction of trainings for new green jobs in construction waste sorting and recycling. ▪ Technical and Economic Feasibility studies conducted for each governorate, focused the on production of local construction materials using C+D waste.

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Promote awareness and behavior change in government, business, and society towards circular economy through the waste sector. ▪ Social development and poverty reduction: Promote awareness and behavior change in government, business, and society towards circular economy through the waste sector. ▪ Resource efficiency: Increase the amount of waste diverted from landfills toward recycling and re-use.
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Estimated Implementation Period	
Start Year – 2022	End Year – 2024

Location(s)	Countrywide	Other key partners	Jordan Green Building Council, Engineering companies, NGOs, universities, research institutions.
Implementing Stakeholders	Lead MPWH (National Building Council), MoEnv Support Municipalities, Ministry of Interior, Jordan Engineers Association	Estimated Budget for this Action	USD 3,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Ensure adequate analysis of C+D materials and training of personnel prior to processing and recycling, in order to prevent any health complications from hazardous materials.
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WS10 | Implement a pilot extended producer responsibility program for e-waste

	Description
	<p>More than 40 million metric tons of e-waste are produced globally each year, making it the fastest growing waste stream. E-waste consists of electrical or electronic post-consumer products. They may contain precious metals such as gold, copper, and nickel, as well as rare materials of strategic value such as indium and palladium. A lot of these metals could be recovered, recycled, and used as secondary raw materials for new products. The complexity of e-waste presents an immense challenge in retrieving the recyclable components – a single product can be made up of more than 1,000 different substances.⁶³ However, if e-waste is disposed of in landfills, many of these components can leak out and pollute the environment.</p> <p>The Middle East region suffers from the absence of an adequate number of e-waste recycling facilities. Landfilling and incineration of e-waste releases toxic fumes that have adverse impacts on human health, such as birth defects, kidney damage or even brain damage. This is due to the plethora of toxic components present in e-waste such as mercury, lead and barium. A proper electronic waste recycling facility will regulate e-waste recycling by offering the Jordanian government and private sector a sustainable electronic waste management option for disposal. There is also the possibility of incorporating e-waste management within the EPR framework, in which producers collect post-consumer products for reprocessing and reuse to provide additional return on their investments (i.e. corporate buyback programs⁶⁴). Currently, there are some internationally-recognized recycling programs, such as the Photovoltaic (PV) Cycle recycling program. This program is a comprehensive takeback and recycling process tailored for PV modules, which recovers almost all PV components - including e-waste material such as semi-conductors – for further reuse in new products.</p> <p>This action proposes the development of a national policy to guide the management of e-waste. The policy development process will be preceded by the establishment of a platform where private sector (manufacturers, producers, importers, retailers, recyclers, and companies purchasing retrieved materials) can provide inputs on e-waste management and inform the development of guidelines and standards to govern the management of the value chain. This policy-informed action will enable the construction of an e-waste management facility through the formulation of requirements and specifications for the proposed facility. The facility will comprise environment-friendly technologies, such as a liquid passivation system and a dust emissions' collector. E-waste recycling leads to the recovery of valuable materials such as glass, gold, copper, and silver, among others. This will contribute to reducing greenhouse gas emissions and saving resources, by reducing the extraction of raw materials. The facility will offer a safe recycling option for outdated electronics and some of the toxic chemicals they contain. It is anticipated that the facility will create a total of 116 jobs with adequate training and protection for processing post-consumer electronic waste products. By removing recyclable substances, the volume of waste disposed of in landfills is reduced. In addition, the retrieval of valuable materials facilitates cost recovery and promotes the facility's financial viability.</p>
Action Objectives	<ul style="list-style-type: none"> ▪ Reduce the need for global mining and metal imports to Jordan through e-waste recycling, translating it into economic and environmental benefits. ▪ Reduce the number of informal rare metals' recycling activities, which have significant health impacts on unprotected waste pickers. ▪ Reduce the environmental impacts from current e-waste management operations.

⁶³ Needhidasan, Santhanam, Melvin Samuel, and Ramalingam Chidambaram. "Electronic Waste - An Emerging Threat to the Environment of Urban India." Journal of Environmental Health Science and Engineering 12, no. 1 (2014): 1-9.

⁶⁴ ewaste. "Technology Buyback Program," n.d.

Implementation Milestones	<ul style="list-style-type: none"> ▪ One platform created through which both the public and private sectors develop solutions to manage e-waste, including the implementation of Extended Producers' Responsibilities. This should include a: consultative platform that allows for the provision of inputs to the drafting of legislative framework on the management of e-waste (which can be part of the EPR policy). ▪ Implementation of public awareness raising and marketing campaigns to educate consumers and producers about the adverse health and environmental impacts of e-waste, while at the same time promoting corporate buyback services. ▪ One assessment study conducted focused on e-waste generation and management, identifying and evaluating options for more effective and environmentally sound e-waste management. ▪ National electronic waste recycling center investment preparation activities commenced, taking into account the following steps: <ul style="list-style-type: none"> ▪ One business case and feasibility for infrastructure completed. ▪ Center facilities designed, assessed for environmental and social impacts, and constructed. ▪ The center facilitates the collection and recovery of electronic waste from post-consumer products more efficiently and safely. ▪ Job creation - when fully implemented, e-waste recovery operations can create more than 100 green, sustainable, and safe job opportunities.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment. ▪ Social development and poverty reduction: Enhance the rate of labor market formalization of the waste sector to enhance economic inclusion and protection of workers. ▪ Natural capital: Ensure adequate collection and treatment of hazardous wastes to prevent environmental contamination. ▪ Resource efficiency: Increase the amount of waste diverted from landfills toward recycling and re-use.

Estimated Implementation Period	
<i>Start Year</i> – 2022	<i>End Year</i> – 2024

Location(s)	To be determined (TBD)	Other key partners	<ul style="list-style-type: none"> ▪ SMEs and informal workers processing material recovery in e-waste. ▪ Importers/manufacturers and traders of electronics (and renewable energy products, like solar panels), maintenance and refurbishment businesses, with consumers (e-waste producers).
Implementing Stakeholders	<i>Lead</i> MoEnv <i>Support</i> Ministry of Industry; Companies producing electronic goods.	Estimated Budget for this Action	USD 3,300,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	UNDP
Action leads to investment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	USD 30,000,000

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5
<ul style="list-style-type: none"> ▪ UNDP is currently working with the Ministry of Environment to better understand the value chain of e-waste production in Jordan, and to identify potential incentive schemes. This experience should be captured in this project's implementation. 							

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Engage large producers of electronic products to establish the most cost and labor efficient mechanisms for material retrieval and reuse, as each company/industry may have different protocols.
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WS11 | Implement program for waste tire disposal and reuse

Description
<p>Discarded scrap tires pose significant environmental and health risks. Tires contain toxic substances, which, as they degrade, end up polluting the soil and waterways when released into the environment. These include oils that contaminate the soil and eliminate plant life. They also include heavy metals such as lead, that can persist in the environment and accumulate over time. Stockpiles of tires in landfills increase fire risk. When heated, tires can be a good fuel, and used tires are often used as fuel for heat generation. However, the smoke from burning tires contains toxic chemicals and particulate matter that poses a serious threat to human health.</p> <p>Each year, an estimated 2.5 million scrap tires are produced in Jordan, with only 2 factories recycling the tires. Collected used tires are used as fuel in cement factories and shredded to produce soft playground surfaces. Sometimes, waste pickers burn discarded tires in open fires to retrieve the metal wires, causing environmental and health problems. While there are regulations related to waste tire disposal and reuse, Jordan currently has no clear target for treatment or reuse. Additional institutional and capacity building efforts are needed to improve existing business models in the value chain in order to enable their replicability and scale-up.</p>

Action Objectives	<ul style="list-style-type: none"> ▪ Divert waste tires from landfills and informal dumpsites. ▪ Reduce the government's cost for managing tire waste.
Implementation Milestones	<ul style="list-style-type: none"> ▪ One feasibility study on tire reuse and recycling in Jordan conducted, with various compatible technologies explored in the study. The study must include: <ul style="list-style-type: none"> ▪ One business case developed for the establishment of a waste tire processing facility. ▪ One environmental and social safeguards assessment of a waste tire processing facility. ▪ Financing secured to build and operate a tire processing facility. At the same time, explore the possibility of PPP. ▪ Regulations on waste tire imports reviewed and enforced, in collaboration with ASEZA. ▪ One capacity building programme developed and implemented, aimed at the government and the private sector.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Economic growth and sustainability: Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment. ▪ Social development and poverty reduction: Promote awareness and behavior change in government, business, and society towards circular economy through the waste sector. ▪ Natural capital: Ensure adequate collection and treatment of hazardous wastes to prevent environmental contamination. ▪ Resource efficiency: Increase the amount of waste diverted from landfills toward recycling and re-use. ▪ Climate change adaptation and mitigation: Improve the resilience of waste management and treatment infrastructure to climate-related disasters (such as floods).

Estimated Implementation Period	
Start Year — 2021	End Year — 2024+

Location(s)	Aqaba (TBD)	Other key partners	<ul style="list-style-type: none"> ▪ JIC, United Nations Development Programme (UNDP), GIZ, private sector companies using tire waste as inputs
Implementing Stakeholders	<p>Lead Ministry of Industry and Trade & Supply</p> <p>Support MoEnv, Private sector investor, ASEZA, and GAM</p>	Estimated Budget for this Action	USD 450,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	USD 22,400,000

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> A strong technical and financial case for processing tire waste within Jordan needs to be presented to private sector investors and donors (including potential partners within the region) to mobilize funding in support of the project.
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WS12 | Develop a joint public-private roadmap to transition to reduce the use of single use plastics at the household and commercial levels

Description	
<p>Studies suggest that Jordanians use 3 billion plastic bags annually, and only 20% of these find their way to the landfill. As of 2016, there were seven factories in Jordan producing biodegradable plastic bags, while there were 400 local factories producing regular plastic bags. At the same time, there are more than 1,300 factories producing plastic products in Jordan which are responsible for 24,000 jobs (roughly 10% of industrial sector employment).⁶⁵ In order to transition away from plastics, substantial market research, policy development, and private sector collaboration will be required.</p> <p>The purpose of this action is to formulate a deliberate, strategic, and systematic transition away from single use plastics at the household and commercial levels. Plastic bags and other plastic materials are a major source of environmental degradation and represent a substantial cost burden on MSW management authorities. Uncollected plastic waste is also responsible for reducing the effectiveness of municipal drainage infrastructure. In 2014, MoEnv introduced regulations on importing and producing plastic bags, with the goal of preserving the environment, the economy, and eliminating the adverse effects of plastics on public health. The objective of this action would be to collect more data on the current situation, measure the full market potential of alternative options, and work with the private sector to map a transition that does not threaten jobs or competitiveness, but rather improves both while at the same time helping the environment.</p>	
Action Objectives	<ul style="list-style-type: none">▪ Assess current impact of single-use plastics and plastic waste on municipal waste management costs, environmental quality, and consumption patterns at both the industrial and commercial levels.▪ Measure the full market potential of alternative options, including the export potential of non-plastic packaging products.▪ Develop partnerships with the private sector to map a transition away from production and consumption of single-use plastics in Jordan, identifying specific business opportunities for investment.
Implementation Milestones	<ul style="list-style-type: none">▪ One market assessment and detailed plastic waste stream analysis, specifically focusing on the manufacture, import, and consumption of single-use plastics for packaging and other applications. This should include preferences, perceptions, and aspirations of local manufacturers of plastic bags, the local community, and environmental NGOs, for an encompassing point of view.▪ One report to identify alternative options to transition away from manufacture of single-use plastics toward more biodegradable options, including examining the regional and international market demand for alternatives to single-use plastics. This should include private sector study tours to examine international best practice.▪ Economic evaluation study of possible financial mechanisms to promote the conversion of the plastic bag industry from standard, single-use plastic bags to more environmentally sound alternatives (e.g. bio-degradable plastic bags, paper bags, recycling, etc.).▪ One report detailing the green growth cost-benefit analysis to inform decision making and identify an implementation plan for the transition. This report should:<ul style="list-style-type: none">▪ Identify which policy recommendations are needed to support the transition, in collaboration with the private sector, ensuring that job creation and SME development are central.▪ Detail and assess the incentives and enforcement regime around plastic waste pollution in urban areas, and identify business options to improve this.▪ A joint public-private roadmap to reduce the use of single-use plastics at the household and commercial levels.▪ A one-year awareness campaign designed and implemented to promote community behavioral change, with regard to the use of single-use plastic bags.

⁶⁵ The Jordan Times. "Authorities eyeing gradual shift to paper bags, biodegradable plastic bags," 2016.

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Natural Capital: Reduce the adverse impacts of waste and landfills on the health of ecosystems. ▪ Sustainable Economic Growth: Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment. ▪ Resource Efficiency: Increase the amount of waste diverted from landfills toward recycling and re-use.
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Estimated Implementation Period	
Start Year – 2021	End Year – 2023

Location(s)	National	Other key partners	International partners to share best practice and promote innovation
Implementing Stakeholders	Lead MoEnv; MOLA; Jordan Chamber of Industry Support Academic institutions involved in materials' science and innovation in plastics use and manufacture. JIC to support investment in new production and consumption technologies and processes.	Estimated Budget for this Action	USD 3,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Industrial and commercial stakeholders should be engaged early on, and the incorporation of their concerns should be seriously considered. ▪ This action would be best implemented in tandem with the implementation of a center of excellence on waste management, the national awareness campaign and the program to support SME development.
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WS13 | Develop a baseline study and roadmap to transition toward green jobs in the waste sector

Description
<p>Waste sector employment in Jordan, especially informal employment, can be risky to the health and well-being of employees. This is due to the high levels of informality in the sector, which allows it to employ many informal workers who work for low wages and in dangerous environments, such as on open dump site or in waste containers around Jordan's cities. Recent studies suggest that waste pickers in Jordan, many of whom are refugees from Syria or Egypt, lack a basic level of protection and suffer devastating health impacts from their work.</p> <p>In 2018, the MOLA worked with the UNDP and the Canadian International Development Program (GAC) to improve the standard work contract for waste pickers, incorporating basic protections against health risks and injury, physical safety and abuse, and payment regulations.⁶⁶ At the same time, waste pickers face substantial social stigma. This project was a first step toward sector formalization, taking into consideration waste pickers' labor rights and working conditions. As a next step, this action proposes to scale up the concept implemented at Al-Ekaider Landfill with a strategic, systematic approach to achieve the goal of formalizing employment in the waste sector, transitioning waste sector employment toward "green jobs" at a national level. A critical achievement of this action would also be to open the first national discussion on the definition of a green job in the Jordanian context, and how quality of employment can be enhanced through the development of a green economy. This discussion would require a collaboration between the MoL, MOLA, MoEnv, and private sector waste companies, including SMEs. This action will contribute to the accomplishment of SDG 8: Promote sustained, inclusive and sustainable economic growth, full productive employment and decent work for all.</p>

Action Objectives	<ul style="list-style-type: none"> Shared strategic vision between the government and the private sector to transition toward decent employment and green jobs in the waste sector. National stakeholders have examined the concept of green jobs and identified opportunities to support green job creation. Enhanced collaboration between public and private stakeholders.
Implementation Milestones	<ul style="list-style-type: none"> One labor market assessment to examine the scope of employment (formal and informal) in Jordan's waste sector at a national level. This assessment should measure the quantitative and qualitative characteristics, as well as estimate the costs of informality. One set of workshops or events to 1) exchange knowledge on the topic of green jobs and 2) come to a contextualized definition of green jobs for Jordan based on international best practices. One report with policy recommendations to show how the government and the private sector can jointly transition toward formality and green jobs in the waste sector by 2030. One set of awareness raising agenda and materials developed and tested.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> Social Development and Poverty Reduction: Increase number of decent, green jobs in the waste sector. Social Development and Poverty Reduction: Enhance the rate of labor market formalization of the waste sector to enhance economic inclusion and protection of workers.

⁶⁶ UNDP, "Improving Solid Waste Management & Income Creation in Host Communities - Rehabilitation of Al-Ekaider Landfill," n.d.

Estimated Implementation Period	
<i>Start Year</i> – 2021	<i>End Year</i> – 2023

Location(s)	National	Other key partners	UNDP, GAC
Implementing Stakeholders	<i>Lead</i> MoEnv, MoL <i>Support</i> MOLA, Ministry of Social Development, Private Sector	Estimated Budget for this Action	USD 1,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> Because waste pickers typically operate within an informal market, substantial preparation and stakeholder identification efforts will be needed. Both government and private sector leaders will be needed to provide access to data and information. This action can be implemented in tandem with ongoing efforts under the Jordan Response Plan to the Syrian Crisis, which call for engaging refugee populations and host communities in the management of hazardous waste and other MSW.
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WS14 | Establish a national upcycling hub nearby appropriate waste management infrastructure

Description
<p>The <i>National Municipal Solid Waste Management Strategy and Action Plan</i> is government's overarching waste framework, as it aims to improve municipal waste services and infrastructure in Jordan. Since the beginning of its implementation in 2015, the government has focused primarily on the development and rehabilitation of critical infrastructure, such as landfill linings, leachate capture, dumpsite containing, and more. In addition to this, several green pilot projects have been implemented to test the ability to achieve sustainability, such as capturing methane gas from landfill emissions for energy generation, establishing composting facilities on landfill sites, and more. These projects are the seeds of green growth, which can be replicated and scaled up to help Jordan achieve its transition to a green economy.</p> <p>One of the great challenges in creating more circular economies is finding a re-use or recycle export market for sorted waste materials that have been diverted from the landfill. While exporting is one option, many countries have found domestic economic opportunities for this material through the establishment of upcycling centers. Upcycling is the reuse of materials in a creative way, transforming waste into new materials or products of better quality and environmental value, rather than recycling them into items of lesser value. Jordan has a strong and growing creative economy, as well as a wealth of waste materials that could be used for upcycling. The purpose of this action is to bring those two things closer together, both strategically and physically. This would establish a domestic upcycling hub to be open to students, artists, entrepreneurs, and innovators who would like access to clean and reusable waste materials for a low or reasonable cost. As a low-cost, non-profit venture, this would be one way through which the government could promote innovation, SME development, creative economy, and circularity.</p>

Action Objectives	<ul style="list-style-type: none"> Promote innovation in the reuse and recycling of waste materials through collaboration with innovation drivers (artists, researchers) and entrepreneurs. Retain and potentially increase the economic value of recovered waste materials. Make efficient and effective use of MSW management infrastructure investments.
Implementation Milestones	<ul style="list-style-type: none"> One market assessment and scoping study mapping out the current upcycling market in Jordan, and identifying critical stakeholders to participate in the upcycling and waste recovery innovation system. One pre-feasibility study to determine the type of activities to be undertaken by the upcycling hub, potential business models, and policy environment for the recovery and use of waste materials for upcycling. One pilot integrated project developed within a close community (e.g. University), implemented and evaluated for its environmental and social impact (most importantly, on awareness raising). This project should: <ul style="list-style-type: none"> Establish source segregation within the campus. Establish awareness and training on waste handling, segregation, and up-cycling. Implement segregation and composting facilities on-campus, including bins and large containers, as well as an upcycling facility on the university, combined with a permanent exhibition. Promote a number of periodic campus-level exhibitions and awareness campaigns to raise awareness among the targeted community. Focus on developing business models for integrated waste management (zero waste goals) by selling up-cycled products through the exhibitions, selling re-cyclable materials which couldn't be used for up-cycling to recycling companies, and produce compost from organic waste. One funding proposal for the establishment of hubs either by private sector investors or donors willing to pilot the effort. This proposal should document and discuss lessons learned from the pilot project.

Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Sustainable Economic Growth: Increase private sector investment and innovation in all phases of the waste value chain, including through domestic and foreign direct investment. ▪ Resource Efficiency: Promote innovation in technology and processes to leverage waste to resource and waste to energy potential.
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Estimated Implementation Period	
Start Year – 2021	End Year – 2024+

Location(s)	TBD by the project	Other key partners	Donors, investors
Implementing Stakeholders	Lead MoEnv (potentially JEF), MOLA Support Ministry of Culture, Universities, research centers, innovation hubs (incubators and accelerators)	Estimated Budget for this Action	USD 1,500,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Unidentified
Action leads to investment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	USD 15,000,000

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Private sector investment is needed for this approach to be sustainable. It would be beneficial to link the physical creative space to the innovation ecosystem. ▪ Linking to major international upcycling networks can improve the hub's success by providing access to global experts, promoting collaboration and market development.
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WS15 | Develop Municipal Solid Waste infrastructure to promote recycling and the use of sanitary landfills

	Description
	<p>Solid waste management (SWM) is a major challenge in Jordan, in both urban and rural areas. Without effective and efficient programs, solid waste originating from domestic and industrial activities poses significant health risks and can have a detrimental impact on the environment. Whilst the existing MSW collection system is considered to be adequate in some large urban centres, services in small towns and rural areas tend to be either poor or non-existent, with an absence of source separation and recycling.</p> <p>The current MSWM system, with a network of landfill sites, dumpsites, and transfer stations, has very few, if any, environmental controls. The low funding, high operating costs, and general lack of adequate sorting and recycling facilities at SW plants has resulted in waste being routinely dumped in unlined cells adjacent to old dumping sites which contain methane producing material. Poor SWM can cause surface water contamination, contribute to soil contamination, air pollution, and leachate – a liquid mix of chemicals that forms as water is filtered through a contaminated area, which can be hazardous if entering soil, surface water, or ground water. For example:</p> <ul style="list-style-type: none"> ▪ In Aqaba City, where approximately 120 tons of SW are produced every day, SW is currently disposed of 12km south-southeast of Aqaba City, in an unlined landfill at the base of the Aqaba Mountains. This waste often remains uncovered, increasing the environmental risks of soil and water contamination, as well as vector breeding and landfill fires. ▪ The Al Rwaished municipality is situated 180km from its nearest landfill site in Alhusseiniat and, due to a lack of funding, SW collected in Al Rwaished is disposed of in dumpsites, rather than processed at landfill facilities, and is disposed of without any type of consideration for proper environmental practices. ▪ In Azraq, a town with a population of 56,150 as well as a Syrian refugee camp, many of the disposal methods used in Al Rwaished are used as well. However, there is an even greater concern for the environmental impact of such methods in Araq, due to its critical importance as the main source of groundwater for Jordan. <p>The purpose of this action is to address the environmental challenges of SWM sector in Jordan, as well as its core focus on recycling and responsible management of waste through both the construction of critical infrastructure, and programming to promote better SW planning at the municipal level, and behavioral change.</p> <p>For this project, each infrastructure intervention will be accompanied with the development of an integrated SWM plan as well as waste segregation and treatment facilities. This project has the potential to be catalytic for the wider transformation of the SWM sector in Jordan. The infrastructure and process components, as well as the specific material and unit recycling components, will also encourage more people in Jordan to recycle.</p>
Action Objectives	<ul style="list-style-type: none"> ▪ Increased environmental and operating efficiency as a result of increased capacity to sort and recycle material through the development and rehabilitation of a series a of sanitary landfill sites, dumpsites, and transfer stations. ▪ Increased awareness and the incentives available to promote recycling will augment the realization of the “Three R’s”, with a greater emphasis on reducing, reusing, and recycling in the SWM sector.

Implementation Milestones	<p>The development of new sanitary landfill sites, with integrated SWM plans and waste segregation and treatment facilities, will dramatically reduce the environmental impact of the MSWM sector, as well as lead to increased efficiencies and significant operating cost savings. This will encourage the private sector to begin projects for waste sorting and recycling. New potential landfill sites include:</p> <ul style="list-style-type: none"> ▪ Al Rwaished (small) Sanitary Landfill: Development of a new sanitary landfill facility will reduce operating costs and enhance the disposal process through the implementation of proper environmental controls. This will encourage the private sector to initiate waste sorting and recycling projects. ▪ Al Azraq Sanitary Landfill: This new site will be the final disposal site for SW collected from Azraq, Safawi, Aldhulial, Halabat, New Hashemite, and New Berin municipalities, and will reduce operation costs whilst enhancing disposal processes under a complete environmental control for the MSW that will encourage the private sector to begin projects for waste sorting and recycling. ▪ Aqaba Waste Management and Landfill: Along with the development of an integrated SWM plan, this potential project includes the redevelopment of the material recovery area to replace current waste scavenging practices and improve recycling capacity, the design of individual landfill cells with each cell sloping towards a leachate collection system, and the installation of a geosynthetic liner to prevent waste liquids polluting soils or ground water. Through the design of a landfill gas management system with the maximum annual generating capacity of 6.053 MWs, the potential for landfill fires will be minimized and existing burnt waste material will be utilized as cover material. <p>In addition, potential new transfer station projects include:</p> <ul style="list-style-type: none"> ▪ Jizah Transfer Station: The new transfer station will serve the municipalities of New Jizah, Muwaqqar, Amreya and New Um Al Rasas, and will decrease the total distance to Gabawi sanitary landfill and will encourage the projects of sorting or recycling facilities. ▪ Madaba Transfer Station: The current landfill site will be closed and replaced with a transfer station which will encourage sorting and recycling activities. ▪ Ain Al Basha Transfer Station: The new transfer station will reduce the distances between the collection of waste and the place of final disposal, reducing operating cost and encouraging private sector participation. <p>Additionally, dumpsites in Al Humra, Al Azraq, Al Shamalyeh, and Al Dhlail can either be rehabilitated or closed and replaced with transfer stations.</p> <p>The comprehensive rehabilitation process for the old dumpsites or the closed dumpsites may include capping, leachate problem solutions, gas collection systems, and land recovery plans which will provide a good opportunity for power generated from gas produced. In turn, these measures will help to solve the environmental problems related to the uncontrolled dumping of SW. The closure and rehabilitation of areas will also provide the option of creating open and clean areas for public use.</p> <p>Concurrent, supporting activities will also include:</p> <ul style="list-style-type: none"> ▪ Updating MSWM policy and regulation. ▪ Establishing a national Management information system (MIS) for MSWM, to act as a reliable electronic database for the recording and analysis of relevant data in the sector. ▪ Integrating the planning of MSWM activities in local and regional administrative level. ▪ Promoting MSW prevention and reuse within the communities.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Resource Efficiency: Mainstream the concepts of reduction in waste generation, recycling, and re-use in the governance of all waste streams; Increase the amount of waste diverted from landfills toward recycling and re-use. ▪ Sustainable Economic Growth: Promote awareness and behavior change in government, business, and society towards circular economy through the waste sector.

Estimated Implementation Period			
Start Year – 2021		End Year – 2025	

Location(s)	-	Other key partners	GCF
Implementing Stakeholders	Lead MOLA Support CVDB, MoEnv	Estimated Budget for this Action	USD 2,000,000 for project preparation support

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	GCF
Action leads to investment	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	USD 79,000,000

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5
<ul style="list-style-type: none"> Proposal documents prepared (in draft) for submission to GCF, in order to request project preparation facility grants for further preparation. 							

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> Jordan has been considerably affected by the deterioration of the security situation in neighboring Syria. In addition, the influx of Syrian refugees considerably increases the SWM requirements for Jordan. To reduce the potential impact of this risk to the SWM sector, the program effects include improved replicability and scalability of SWM services to ensure all regions are covered. The willingness of the Jordanian population to pay for recycling services may also impact the financial success of this project. To mitigate this, the program includes an awareness campaign to raise the population's awareness for the risks of poor SWM, the environmental impact of incorrect disposal of hazardous waste, and the continued use of energy intensive goods.
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WS16 | Implement a comprehensive national cleanup campaign for SW littering

Description	
<p>Pollution from discarded SW is a priority challenge facing Jordan. Not only does the presence of open garbage in urban areas present a health and safety hazard to citizens, the large amount of litter in other open spaces (such as in parks, forests, and waterways) can discourage tourism and investment, perpetuating an image which is inconsistent with Jordan's Vision 2025. Few studies have been undertaken to fully capture the scope of the challenge or its impacts on the environment and society; however, most authorities agree that it is a serious challenge that requires broader public awareness and a shift in behavior and attitudes. Accordingly, in recent years, MoEnv has led cleanup efforts, bringing students, associations, and concerned citizens together to clean up the country's forests, parks, beaches, and tourist sites. At one such event in 2019, an estimated 40,000 people nationwide joined an effort to clean up the country⁶⁷. However, much more work remains to be done, in order to ensure a cultural and behavioral shift away from litter.</p> <p>The purpose of this action is to increase the understanding of the drivers and impacts associated with littering, and design a set of awareness campaigns and government, NGO, and private sector partnerships to achieve cleanup and behavior change. Significantly, this effort will mobilize actions across all sectors and segments of society, with a strong focus on youth and community leadership, to ensure that it is sustainable and embedded in the hearts and minds of Jordanians.</p>	
Action Objectives	<ul style="list-style-type: none">▪ Develop cross-sectoral governmental partnerships to ensure preventing littering is a priority for different economic activities and issue areas.▪ Contribute to changing littering behaviors by spreading awareness and providing financing for local cleanup campaigns.▪ Improve the government's understanding of the drivers and impacts associated with littering, and methods to enforce anti-littering laws and regulations.
Implementation Milestones	<ul style="list-style-type: none">▪ Implement cleanup activities on key roads and thoroughfares in municipalities. This activity will begin by taking stock of the current status of SW pollution and littering in Jordan, addressing causes, impacts, hotspots, as well as data availability and gaps. This will focus on main roads in urban areas and highways. This activity will lead to the development of a tender for services from one or more waste management companies to collect litter along major streets and roads in Jordan. The MPWH will benefit from input and monitoring from MoEnv. Emphasis will be placed on the importance of providing decent work conditions and equal opportunity employment for women. Develop and implement municipal cleanup campaigns and action plans in key municipalities. This activity will identify the roles and responsibilities within municipalities for litter cleanup, while at the same time, in cooperation with Royal Rangers, identify enforcement needs. Action plans and campaigns will also be developed by the relevant authorities to address littering in forests (MoAg, Royal Society for the Conservation of Nature (RSCN)), touristic places (Ministry of Tourism and Antiquities), "gray areas" between highways and municipalities, and public parks (MOLA, Ministry of Interior, and municipalities).▪ Introduce a national cleanup campaign targeted at youth. This campaign will be focused on addressing youth perceptions of waste and litter from a young age, empowering youth to communicate key messages within their families, schools, and communities. The campaign will include the development of:<ul style="list-style-type: none">▪ A volunteer program which will include the establishment of partnerships with youth centers, schools, and public institutions. This will be designed by the Ministry of Youth, in cooperation with MoEnv, and built on international and regional best practice.▪ A social responsibility campaign for university students, which will include support for on-campus groups to promote littering awareness and behavior change, as well as the provision of incentives for results-based cleanup actions (such as credit hours for service, etc.). This will be designed by the Ministry of Higher Education in cooperation with MoEnv.

⁶⁷ UNDP, "Improving Solid Waste Management & Income Creation in Host Communities - Rehabilitation of Al Ekaider Landfill," n.d.

Implementation Milestones	<ul style="list-style-type: none"> ▪ Design and implement a social marketing campaign aimed at changing littering behavior. This will be a comprehensive campaign targeting students, universities, civil servants, drivers, picnickers, and tourists. The program will be designed based on scientific market research to better identify the problem statements and target segments, providing information to properly design the marketing campaign (messages, messaging channels, etc.) and maximize its effectiveness. It will be implemented by MoEnv, in partnership with relevant authorities, and featuring influential national actors and organizations. ▪ Establish a grants facility through the JEF to finance the implementation of community awareness projects and cleanup campaigns. The funds would be used to cover the following: <ul style="list-style-type: none"> ▪ NGO grants to support identification of cleanup hotspots and manage the cleanup activities. Equipment for cleanup campaigns for municipalities. Transport of people to cleanup sites as needed. Disposal costs for collected waste as needed. Small business and/or innovation grants to support innovation in the development of cleanup activities.
Relevant Green Growth Objectives	<ul style="list-style-type: none"> ▪ Climate Change Mitigation and Adaptation: Build resilience by reducing the clogging of drainage systems in urban areas. ▪ Natural Capital: Reduce impact of waste on the natural environment. ▪ Social Development: Increase the awareness and inclusion of youth and communities.

Estimated Implementation Period	
Start Year – 2021	End Year – 2025

Location(s)	National	Other key partners	-
Implementing Stakeholders	Lead MoEnv, JEF, Royal Rangers Support Ministry of Youth, Ministry of Higher Education and resea	Estimated Budget for this Action	USD 5,000,000

Financing Secured	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Potential Source of Funding	Government budget, donor support needed
Action leads to investment	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> This action is an Investment opportunity	Estimated Investment Size	-

Level of Priority			Readiness for Implementation				
Very High	High	Medium	1	2	3	4	5

Implementation Risk Mitigation Measures	<ul style="list-style-type: none"> ▪ Implementation of this action will require strong coordination on behalf of MoEnv; this may require a steering committee (or other coordination platform) to work with partners. As a behavior change campaign, this project must ensure it fully studies and accounts for the different cultural and attitudinal contexts for the problem, and embeds appropriate measures to address them from the outset.
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ANNEX 1: Waste Sector Green Growth Results Framework

The Green Growth Results Framework below was constructed with the support of the MoLA, DOS, and other national actors in accordance with international best practices in the field of green growth. This collection of indicators can be used to better understand the availability of green

growth-related data in Jordan. The Government of Jordan is continuously striving to improve the quantity and quality of data for decision making in the area of sustainable development and this framework will be continuously revisited and improved throughout the implementation phase.

[illegible]

[illegible]

[illegible]

ANNEX 2: Relationship with National SW Management Strategy (MoLA)

	Actions	Long-term National Transport Strategy and Action Plan 2015-2030		
		Challenges and Barriers	Objectives/ Targets	Actions/measures proposed in strategy
WS01	Review and update NSAP 2015-2034 to integrate non- Municipal Solid Waste and elaborate integrated waste management approaches	<ul style="list-style-type: none"> ▪ The limited financial resources allocated to the MSWM sector. ▪ Overlap and ambiguity of institutional roles and responsibilities between concerned authorities. ▪ Low availability and reliability of MSWM data and information. ▪ Limited private sector participation in MSWM activities. ▪ Insufficient qualified personnel on Municipalities and JSCs, in many cases. ▪ No comprehensive single regulation currently in force for MSWM in Jordan. ▪ A lack of modern, specialized, and comprehensive legislative frameworks (e.g. for tariff and payments collection, for sorting-at-source systems of recyclables and biowaste, for typology/ standardization of MSWM systems' planning and design, for data recording, etc.). 	<p>Objectives: All of below</p> <p>Targets:</p> <ul style="list-style-type: none"> ▪ Targets for coverage of MSW street-cleaning and collection services. ▪ Targets for the separate collection of recyclables (at least for paper, metal, plastic, and glass). ▪ Targets for preparing for re-use and the recycling of MSW materials (at least for paper, metal, plastic, and glass). ▪ Targets for ceasing operation of uncontrolled or unlicensed disposal sites. 	All of below
WS02	Enhance the financial management and strategic planning capacity of municipal waste management authorities	<ul style="list-style-type: none"> ▪ The limited financial resources allocated to the MSWM sector. ▪ Overlap and ambiguity of institutional roles and responsibilities between concerned authorities. ▪ Lack of specifically determined responsibilities for sophisticated MSWM activities, such as recycling, recovery, etc. ▪ Insufficient qualified personnel on Municipalities and JSCs, in many cases. ▪ Lack of autonomy from Municipalities and JSCs with regards to administrative, financial, and operational capacity. ▪ Splitting and merging of small Municipalities in Jordan often creates administrative gaps with effect – inter alia – to MSWM. 	<ul style="list-style-type: none"> ▪ Promoting effective capacity building activities to maintain and upgrade the MSWM system in the long-term. ▪ Extension of the MSW collection coverage levels to ultimately reach 100% of the population. ▪ Establishment of the appropriate tools for recording, analysing, monitoring, and promoting efficient decision-making of MSWM related issues, at the national, regional, and local levels. 	<ul style="list-style-type: none"> ▪ Clear definition of roles and responsibilities related to MSWM through the national-level legislative framework (see also below). ▪ Creation of a dedicated MSWM department in MOLA to guide, support, assist, and supervise Municipalities and the JSCs. ▪ Restructuring of JSCs to improve efficiency of the sector.

WS02	Enhance the financial management and strategic planning capacity of municipal waste management authorities	<ul style="list-style-type: none"> ▪ The key economic indicators (CAPEX, OPEX, REVENUE, and COST RECOVERY) and the efficiency - effectiveness of the existing MSWM system, are at alarmingly adverse levels, for the vast majority of MSWM operators. ▪ The current MSWM fee collection system (through the Electricity Company, deducting directly 10% as administrative charges plus the cost of street-lighting) doesn't allow for direct collection of fees and flexible funding of MSWM activities. 		<ul style="list-style-type: none"> ▪ Increasing decentralized responsibilities of Municipalities and JSCs in MSWM. ➔ Adopt, establish and application of Full Cost Accounting (FCA) method to all levels of MSWM (Municipalities, JSCs, MOLA) – SHORT-TERM
WS03	Introduce a policy dialogue platform for implementing EPR in the waste sector	<ul style="list-style-type: none"> ▪ Limited private sector participation in MSWM activities. ▪ There are no specifically determined responsibilities for sophisticated MSWM activities, such as recycling, recovery, etc. ▪ There is a lack of modern, specialized, and comprehensive legislative framework (e.g. for tariff and payments collection, for sorting-at-source systems of recyclables and biowaste, for typology/standardization of MSWM systems' planning and design, for data recording, etc.). 	<ul style="list-style-type: none"> ▪ Promotion of MSW prevention and reuse practices. ▪ Promotion of waste sorting-at-source with a view to increase MSW prevention, reuse, and recycling. 	<ul style="list-style-type: none"> ▪ Clear definition of roles and responsibilities related to MSWM through the national-level legislative framework (see also below). ▪ Monitor performance of EPR programs to ensure shifting of responsibilities from the public to the private sector with a view to achieve reduction of total generated MSW.
WS04	Establish a national center for excellence on waste management and circular economy to promote innovation, training, R&D, investment and policy work.	<ul style="list-style-type: none"> ▪ The unreliability and limited availability of data in the WS sector. ▪ Lack of adequate policies and regulations for the different waste streams. 	<ul style="list-style-type: none"> ▪ Establishment of the appropriate tools for recording, analyzing, monitoring, and efficient decision-making of MSWM related issues, at the national, regional, and local levels. 	<ul style="list-style-type: none"> ▪ Establishment of a MSWM Public Awareness & Education Program Unit in MOLA or CVDB to monitor and assist the implementation of the Public Awareness and Education program.
WS05	Design and implement a national awareness campaign about circular economy and waste management	<ul style="list-style-type: none"> ▪ Most of the existing awareness programs were/are implemented as short term campaigns. ▪ There has been no integration of these programs into the Municipality/NGOs activities. ▪ There is a lack of financial resources to implement public awareness and public participation programs in Municipalities and JSCs ▪ There is a lack of a national umbrella, such as a national strategy for public awareness and public participation, as it is proven that implementing a national awareness program where all Municipalities are participating and collaborating would lead to more effective results and greater success. 	<ul style="list-style-type: none"> ▪ Promoting effective public awareness and education on MSWM issues in the long-term. 	<ul style="list-style-type: none"> ▪ Implementation Phase of the Public Awareness and Education program – in one Major City of each geographical region.

WS06	Enhance the financial viability of SMEs in the waste sector through targeted business development support	<ul style="list-style-type: none"> ▪ Limited private sector participation in MSWM activities. ▪ There is a lack of financial resources to implement public awareness and public participation programs in Municipalities and JSCs. ▪ There is a lack of a national umbrella, such as a national strategy for public awareness and public participation, as it is proven that implementing a national awareness program where all Municipalities are participating and collaborating would lead to more effective results and greater success. 	<ul style="list-style-type: none"> ▪ Increase of MSWM system efficiency through public administration initiatives and private sector involvement. 	<ul style="list-style-type: none"> ▪ Provide increased Return of Equity (RoE) in order to make the PPP approach attractive to the private sector. ▪ Provision of incentives to waste-pickers to participate in the cooperative(s) (integration in the social security program, health insurance, financial incentives, etc.).
WS07	Conduct market assessment and feasibility study to identify potential projects and program to divert organic waste from Municipal Solid Waste streams	<ul style="list-style-type: none"> ▪ There are no specifically determined responsibilities for sophisticated MSWM activities, such as recycling, recovery, etc. ▪ Complete absence of regular waste sorting-at-source programs all over the Kingdom. 	<ul style="list-style-type: none"> ▪ Utilization of other revenue generating sources; ▪ Identification of the most cost effective, efficient, affordable, and quality-service environmentally and socially sound MSWM scheme for the Municipality, that will be in line with the respective Regional MSWM Plan and National MSWM Strategy and policies. 	<ul style="list-style-type: none"> ▪ Assessment of the feasibility of establishment and operation of local-scale MSWM facilities (materials recovery facilities (MRFs), composting plants, etc.). ▪ Utilization of other revenue generating sources; i.e. revenues from sale of avoided or reduced emissions (e.g., methane expressed as carbon dioxide equivalent GHG). ▪ Tendering, award, conduction, and approval of a study for the development of technical specifications for: recycling/materials' recovery (including MRFs, composting facilities, anaerobic digestion facilities). ▪ Tendering, award, conduction, and approval of local market surveys/studies for the assessment of possible uses of recyclables, refuse-derived fuel (RDF), compost, as well as digestate Compost-Like Output (digestate compost-like-output (CLO)).

WS07	Conduct market assessment and feasibility study to identify potential projects and program to divert organic waste from Municipal Solid Waste streams			<ul style="list-style-type: none"> ▪ Tendering, award, conduction, and approval of studies (including Environmental and Social Impact Assessment (ESIA)) related to the establishment of: - “clean MRFs” for pre-segregated recyclables; - composting units for pre-segregated biowaste.
WS08	Develop and implement a Master Plan for National Hazardous Waste Management and the rehabilitation of Swaqa Hazardous Waste Landfill	<ul style="list-style-type: none"> ▪ Lack of financing (allocated for) and policies for the HWM in Jordan. ▪ C&D waste, hazardous medical and industrial waste) usually end up in the MSW storage network (bins, containers), thus deteriorating the MSW quality and risk. ▪ Lack of a Management Information System (MIS) at the national level for recording and analysing relevant MSWM data, making regular monitoring, planning, and problem solving in the sector difficult. ▪ Complete absence of regular waste sorting-at-source programs all over the Kingdom. 	<ul style="list-style-type: none"> ▪ Promotion of separate collection and management of special and hazardous waste; ▪ Increase of efficiency of infrastructure and equipment maintenance. ▪ Mitigation of risks on the environment and human health by MSWM through integrated management (planning, design, and operation). ▪ Establishment of appropriate MSW treatment facilities with respect to the ISWM hierarchy in the long-term. 	<ul style="list-style-type: none"> ▪ Enforcement of the avoidance of co-management of MSW with hazardous (e.g. medical, industrial, etc.) or special SW streams (e.g. Waste from Electrical & Electronic Equipment (WEEE), waste batteries and accumulators, components of End-of-Life Vehicles (ELVs), used tires, C&D Waste, etc.) currently ending up in waste collectors such as bins, etc.). ▪ Establishment and promotion of systems and plants for integrated management of the aforementioned special and hazardous SW streams, with aim to cover the whole Kingdom, with the participation of the public and/or the private sector. ▪ Defining the framework for transboundary importing/exporting hazardous and non-hazardous SW.

WS09	<p>Develop and implement a national policy and regulations for the management of C&D waste.</p>	<ul style="list-style-type: none"> ▪ C&D waste, hazardous medical and industrial waste) usually end up in the MSW storage network (bins, containers), thus deteriorating the MSW quality and risk. ▪ There are no specifically determined responsibilities for sophisticated MSWM activities, such as recycling, recovery, etc. ▪ Low levels of MSW recycling and energy recovery facilities. ▪ There is a lack of modern, specialized, and comprehensive legislative frameworks (e.g. for tariff and payments collection, for sorting-at-source systems of recyclables and biowaste, for typology/standardization of MSWM systems' planning and design, for data recording, etc.). 	<ul style="list-style-type: none"> ▪ Strengthening of the Jordanian MSWM sector in order to correspond to potential emergency conditions that may occur in the future; ▪ Increase of efficiency of infrastructure and equipment maintenance. 	<ul style="list-style-type: none"> ▪ Enforcement of the avoidance of co-management of MSW with hazardous (e.g. medical, industrial, etc.) or special SW streams (e.g. Waste from WEEE, waste batteries and accumulators, components of ELVs, used tires, C&D Waste, etc.) currently ending up in waste collectors such as bins, etc.). ▪ Exclusion from the disposal facilities of the following: liquid waste, flammable waste, explosive or oxidizing waste, medical or infectious clinical waste, used tires (with certain exceptions), C&D, any other type of waste which does not meet specific acceptance criteria.
WS10	<p>Implement a pilot Extended Producer Responsibility program for e-waste</p>	<ul style="list-style-type: none"> ▪ WEEE, ELV components, batteries and accumulators, used tires, C&D waste, hazardous medical and industrial waste) usually end up in the MSW storage network (bins, containers), thus deteriorating the MSW quality and risk. ▪ Lack of a Management Information System (MIS) at the national level for recording and analyzing relevant MSWM data, making regular monitoring, planning, and problem solving in the sector difficult. ▪ Complete absence of regular sorting-at-source programs all over the Kingdom. ▪ There are no specifically determined responsibilities for sophisticated MSWM activities, such as recycling, recovery, etc. ▪ Low levels of MSW recycling and energy recovery facilities. ▪ MSW prevention and reuse practices and initiatives are almost absent. ▪ There is a lack of modern, specialized, and comprehensive legislative frameworks (e.g. for tariff and payments collection, for sorting-at-source systems of recyclables and biowaste, for typology/standardization of MSWM systems' planning and design, for data recording, etc.). 	<ul style="list-style-type: none"> ▪ Mitigation of risks on the environment and human health by MSWM through integrated management (planning, design, and operation). 	<p>➔ Establishment of product stewardship initiatives for special waste streams (WEEE, batteries and accumulators, ELVs, etc. – no more than two initiatives per 5-years' period) ---- LONG_TERM</p>

WS11	Implement program for waste tire disposal and reuse.	<ul style="list-style-type: none"> Complete absence of regular waste sorting-at-source programs all over the Kingdom. 	<ul style="list-style-type: none"> Mitigation of risks on the environment and human health by MSWM through integrated management (planning, design and operation). 	<ul style="list-style-type: none"> Provide increased return on equity (RoE) in order to make the PPP approach attractive to the private sector.
WS12	Develop a joint public-private roadmap to transition to reduce the use of single use plastics at the household and commercial levels	n/a	n/a	n/a
WS13	Develop a baseline study and roadmap to transition toward green jobs in the waste sector	<ul style="list-style-type: none"> Extensive informal waste-picking in the city and at the dumpsite level, posing significant negative impacts to public hygiene. 	<ul style="list-style-type: none"> Integration of informal waste-pickers in the new MSWM facilities. 	<ul style="list-style-type: none"> Establishment of cooperative(s) of informal waste-picking and recycling sector, with the goal to ensure safe operation. Issuance of a regulation for defining the process and specifications for the integration of waste-pickers in the new MSWM system, as well as their responsibilities and licensing. Issuance of technical specifications and instructions for safe operation of waste-pickers, including health, occupational safety, and environment issues.
WS14	Establish a national upcycling hub nearby appropriate waste management infrastructure	n/a	n/a	n/a
WS15	Develop Municipal Solid Waste infrastructure to promote recycling and the use of sanitary landfills	n/a	n/a	n/a
WS16	Implement a national litter cleanup and behavior change campaign	n/a	n/a	n/a

