

Hashemite Kingdom of Jordan Ministry of Water and Irrigation



National Water Conservation Roadmap 2024









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The Hashemite Kingdom of Jordan stands as one of the world's most water-scarce nations. The foreseeable future signals a potential worsening of this scarcity, particularly in the short-term. Successive alterations in the surrounding environment—spanning natural and demographic factors, urban and economic development, as well as geopolitical, social, and technological considerationshave intensified the strain on water resources. This heightened pressure has resulted in a decrease in the annual per capita share of renewable freshwater, plummeting to a mere 61 cubic meters per year. Notably, this figure falls significantly below the internationally recognized absolute water poverty line of 500 cubic meters per person per year.

Water demand management is crucial for addressing water sector challenges by effectively rationalizing consumption and guiding users towards approved, sustainable use. This consequently preserves local resources—including energy, food, and the environment—and positively affects various agricultural, industrial, commercial, and domestic sectors, leading to water security and a successful, sustainable development agenda.

The vision for economic modernization in the Hashemite Kingdom of Jordan sheds light on numerous challenges confronting the water sector, primarily around water demand management. These challenges encompass behavioral aspects, notably the limited awareness regarding water management and water use efficiency. Additionally, institutional weaknesses hinder the interdependence and integration between the water sector and other developmental sectors. Ministries and administrations across various sectors fail to cooperate and coordinate effectively which hinders optimal water resource utility. It becomes imperative to address issues like the over-pumping of groundwater, requiring a shift towards sustainable practices that consider the long-term viability and quality of these crucial resources. On a technical front, data-related challenges persist, with limited and restricted data availability. Poor data management undermines its potential contribution to decision-making and strategic planning functions, particularly concerning institutional perspectives on challenges within the water sector. This includes updating governance frameworks and enhancing water demand management at the national level.

Addressing these challenges necessitates innovative solutions geared towards sustainability, all within a strategic framework that guarantees the institutionalization of planned actions and interventions. The focus should be on enhancing water use efficiency, promoting the adoption of responsible behaviors, and discouraging wasteful practices. In addition to building the capacity of





relevant institutions and individuals to achieve Royal and national aspirations and directives it is critical that these aspirations are grounded in robust governance frameworks, to ensure that Jordan is recognized as a regional and global model for effective water management.

The Ministry of Water and Irrigation (MWI) in Jordan plans for and oversees the water sector activities with a commitment to innovative approaches, the Ministry aims to implement integrated water resources management in line with the pillars and objectives in the National Water Strategy 2023–2040. The National Water Strategy will guide specific Ministry actions, addressing crucial issues in water sector management. Key focus areas include enhancing financial performance and sustainability, implementing data-driven decision-making mechanisms, fostering innovation and technology adoption, optimizing energy efficiency, improving water use efficiency, addressing the impacts of climate change, and promoting the adoption of rational behaviors in water consumption. Through these targeted measures, the Ministry strives to ensure a holistic and effective approach to water resource management in Jordan.

The Ministry seeks to meet the needs of a struggling water sector. Activities bolstering the water sector that the Ministry will undertake may include (1) restructuring groundwater extraction legislation and efficiency of use, (2) developing and implementing executive programs and initiatives to preserve surface and groundwater resources, (3) improving resource use efficiency, (4) encouraging the adoption of the use of innovative technological solutions to address water conservation challenges, and (5) incentivizing national water conservation efforts in all sectors within best practices that influence behavior.

To realize the vision of economic modernization in the Kingdom and fulfill the objectives of the National Water Strategy, the Ministry is identifying immediate, medium, and long-term solutions to address needs. Adopting an institutional approach, the Ministry partners with various sectors and stakeholders to balance the growing demand for water with its available supply.

It is necessary to emphasize the significance of water conservation and demand management as additional and crucial to maintaining water sources. Presently, many programs predominantly concentrate on water supply management, focusing on increasing investments in new water resources, enhancing infrastructure, and minimizing non-revenue water.





Unfortunately, many water management programs often overlook the importance of demand management as a valuable source for achieving water security. The Ministry has committed to changing this paradigm and will ensure that demand management plays a central role in achieving a sustainable and secure water future for the Kingdom.

The context above outlines the imperative for establishing a national roadmap for water conservation. This National Water Conservation Roadmap contains strategic directions that mirror priority operational initiatives and programs from the Ministry of Water and Irrigation. These initiatives leverage best practices in communication processes to instigate community behavioral change, employing diverse tools to fulfill the objectives in the second pillar goal of the National Water Strategy. This goal centers on restoring the balance between water supply and demand, with a specific focus on sub-goal 4.2. This sub-goal underscores the significance of promoting water use efficiency across water use purposes and among consumers.

The National Water Conservation Roadmap plays a pivotal role in optimizing water resource utilization and positions national water security as a cross-sectoral responsibility.

It establishes clear indicators to ensure procedural and practical sustainability

that will enhance water use efficiency. This roadmap addresses a broad spectrum of water users, including houses, public and private institutions, agriculture, and industry; this fosters effective partnerships that will aid in initiative implementation through the application of best practices in communication for behavioral change. This roadmap delineates overarching strategic directions and frameworks for water demand management, providing a foundation for subsequent detailed work plans (operational) for each initiative. These detailed plans will consider the specifics, implementation steps, financial resources, and necessary timeframes meticulously.





The Vision

Building on the findings of research, discussions, and workshops, the National Water Conservation Roadmap's vision is **"ensuring water security through enabling water use efficiency."** The matrix of strategic objectives and initiatives are split into legislative, economic, and social pillars.

Objectives and Initiatives







Improving water efficiency in irrigation is a priority for agricultural development. Water demand management in irrigated agriculture helps enhance agricultural productivity, improve competitiveness, and adapt to water scarcity, especially as the agriculture sector utilizes more than half of the Kingdom's renewable water resources. The agricultural sector initiatives in the roadmap attempt to lay the ground framework for institutionalizing irrigation efficiency improvement; considering the multiplicity of sector players and the overlap or lack of clarity in activity areas contributes to limited effectiveness in engaging farmers to prompt behavioral change and promote the widespread adoption of efficient irrigation technology.

The initiatives follow comprehensive legislative and administrative frameworks to provide systematic institutional instruments for improving technical and financial capacities for irrigation efficiency. Organizations commit to upholding the quality and standards of irrigation technology; their commitment is integral in ensuring broad market adoption. Concurrently, the initiatives address the development of legislative frameworks governing groundwater use, which remains a pivotal irrigation resource. The roadmap emphasizes the importance of farm-level water audits as a tool to evaluate and improve irrigation

practices. Additionally, the agricultural sector initiatives recommend the establishment of robust technical and institutional structures to facilitate wider reuse of treated wastewater. These efforts extend to influencing farmers' irrigation approaches to promote a culture of efficiency and adherence to best practices within the agricultural community.

The Strategic Objective

Improve water use efficiency in irrigated agriculture through the following five initiatives:

Establish and enforce standards and technical rules related to irrigation systems technologies.

- Conducting a gap analysis and regulatory impact assessment for proposed standards/technical rules.
- Establishing a working group or coordination mechanism of stakeholders and specialists to set standards/technical rules.
- Specifying the efficiency criteria in the standards/technical rules.
- Developing draft standards/technical rules.



- Validating standards/technical rules by circulating them and then obtaining feedback and subsequent approvals.
- Building the necessary partnerships to effectively execute the standards/ technical rules.

Institutionalize farm-level water audits and capacity-building interventions related to the water audit, as well as in the design and installation of efficient irrigation networks.

Areas of work include:

- Defining and focal areas clearly. Codifying methods for performing farm-level water audits. This entails creating a Water Audit Manual as well as integrating these processes into the existing operational frameworks and administrative protocols of the pertinent government bodies.
- Improving stakeholders' ability to conduct water audits and design efficient irrigation systems. This encompasses targeted skill development of Ministry of Agriculture staff, agricultural extension workers, Water Authority of Jordan groundwater management personnel, Jordan Valley Authority irrigation managers, water user association members, private sector employees, and irrigation and agricultural material sector professionals.

- Promoting knowledge and practical skills among farmers regarding water audit techniques through hands-on training workshops.
- Appointing liaison officers from water user associations, agricultural organizations, and governmental departments to execute water audits and contribute to the development of better irrigation infrastructures.

Update procedures of the management and governance of groundwater use in irrigation to reduce agricultural consumption.

- Conducting technical research on groundwater management, land use planning, and water value to improve the availability and quality of information for decision-makers.
- Revising the groundwater monitoring bylaw to incentivize farmers who prioritize efficient water management. Examples include linking free quantities of groundwater consumption to on-farm irrigation efficiency measures and implementing water audit recommendations.





- Improving groundwater consumption estimation for irrigation using updated crop water requirements information in addition to the use of technical and administrative indicators for informed decision-making support, this would include using remote sensing tools and Inference of water consumption by electricity consumption.
- Building the Water Authority of Jordan's and Jordan Valley Authority's capacities to use technological and field water consumption estimation methods as well as institutionalizing these methods within the official work procedures of the two authorities.

Expand the use of non-conven tional water resources in irrigation to reduce reliance on freshwater resources.

Areas of work include:

- Developing and revising standards/ technical rules and technical studies regarding treated wastewater reuse from wastewater treatment plants for municipal and industrial water, promoting wider usage.
- Developing a manual for the safe reuse of treated wastewater in irrigation and developing field programs to educate farmers on these practices.
- Enhancing existing programs to ensure safe reuse among farmers, particularly

for crops that are allowed to be irrigated with treated wastewater.

- Develop procedures, information, databases, and maps to promote the reuse of treated wastewater near wastewater treatment plants, industrial areas, and potential groundwater recharge sites. Using these resources to aid decision-making on expanding reuse.
- Developing public-private partnerships to increase utilization of treated wastewater.

Improve farm-level water management practices through behavior change and incentives.

- Issuing a guide/manual for best irrigation practices.
- Developing and implementing training and awareness programs for irrigation and economically viable crops using best practices guides/manuals.
- Designing and approving incentives to improve irrigation efficiency and collaborating with the private sector to implement them.





Municipal water consumption ranks as the second largest consumer of water encompassing resources, domestic, commercial, tourism, and governmental institutions. The growing population and development needs will likely intensify the demand for municipal water, placing added strain on finite water supplies and the financial resources of government and water utilities. Municipal sectors must take a focused approach to water demand management to reduce waste and enhance national water security. Key initiatives have been launched by The Ministry to encourage efficient water use among large water consumers.

These include water audit standardization, water-saving technology integration, initiatives implementation to shift social behavior towards conservation, and community engagement to elevate water use efficiency. MWI aims through these initiatives to develop a sustainable culture regarding water conservation across communities. The Ministry of Water and Irrigation will implement strategies that form alliances with civil society and the private sector to introduce incentives that foster efficient water use.

The Strategic Objective

Increase water use efficiency in the municipal sector through the following three initiatives:

Improve water use efficiency in the municipal sector by large consumers.

- Identifying large water consumers and their water consumption in the municipal sector and then engaging with them to elevate their understanding of Jordan's water situation and identify effective water conservation strategies by clarifying their role in enhancing water security and potential financial benefits from conservation.
- Creating effective collaboration and coordination structures to implement water audits and their recommendations.
- Conducting water audits for large water users and documenting water consumption statistics before and after the implementation of audit recommendations.
- Providing specialized training on water audits for technicians and engineers at the designated establishments.





Promote the adoption of water-saving technologies and practices by both large consumers and households.

Areas of work include:

- Revising and updating best practice manuals dedicated to water management and conservation within the municipal sector.
- Raising private sector awareness, specifically water-saving technology providers, about approved standards for water-saving equipment and tools.
- Creating strategic partnerships to foster the adoption of the standards and formulating enforcement mechanisms through cooperation with pertinent entities such as the General Customs Department, the Jordan Standards and Metrology Organization, water-saving technology suppliers, and the Royal Scientific Society.
- Familiarizing large water consumers with water-saving technologies and methodologies via meetings, workshops, and promotional campaigns.
- Crafting technical and financial incentives to encourage the adoption of water-saving technologies and practices.

Documenting information and statistics pertaining to water-saving technology practices and implementation.

Institutionalize water auditing and boost cross-sector institutional participation to improve water use efficiency.

- Integrating water audits into the legislative framework so the Ministry of Water and Irrigation may adopt water audit practices and guidelines into official work procedures.
- ldentifying key water consumers.
- Communicating with target entities to convey the importance and impact of water conservation in their facilities by sharing a success story from the same target group about the implementation of water audit recommendations. Preparing an d signing memoranda of understanding between the Ministry of Water and Irrigation and the targeted partner institutions to carry out water audits at these institutions and their affiliates.





Despite the industrial sector's relatively low water usage, its significant contribution to the GDP presents a valuable economic opportunity. Raising the efficiency of water consumption in this sector will have a favorable impact on production costs and the environmental image of Jordanian industrial products, aligning with the broader objectives of transitioning toward a green economy. This strategic move not only underscores Jordan's commitment to sustainable practices but also opens new doors for the export of Jordanian industrial products.

Historically, dialogue the between Jordan's industrial and water sectors has been limited, hindering opportunities for mutual growth. To bridge this gap, a comprehensive framework of initiatives has been developed by MWI to encourage collaboration, aiming to benefit all stakeholders involved. These efforts are geared toward improving water efficiency in industrial operations, a crucial step in addressing the escalating demand for water and fostering sustainable industrial development.

The initiatives outlined are multi-faceted, focusing on institutionalizing water efficiency benchmarks within the industrial sector, increasing private sector participation in wastewater management and reuse, and encouraging the use of alternative water sources. Additionally, they emphasize the dissemination of water-efficient practices through comprehensive capacity building and the provision of incentives aimed at altering behaviors. The goal of these initiatives is to boost the competitiveness of Jordanian industries on a global scale, contributing significantly to the nation's industrial advancement and water resource security.

The Strategic Objective

Develop an industrial water consumption benchmarking tool to support water use management and efficiency in the industrial sector.

- Conducting comprehensive water audits within factories to ascertain the current levels of water consumption across Jordanian industries.
- Researching and assimilating global best practices and current trends in industrial water consumption to inform benchmark development.
- Develop detailed specifications and a guideline document that defines optimal water consumption benchmarks for each industrial category.
- Integrating these benchmarks into the existing framework of licensing and evaluation processes or, where necessary, introducing new mechanisms to ensure their institutionalization and adoption.





Launching targeted awareness campaigns designed to educate on the established benchmarks, focusing on promoting optimal water use across various industrial sectors.

Promote the use of non-conventional water resources in the industrial sector.

Areas of work include:

- Developing an investment manual and map that identifies and fosters investment in building decentralized wastewater treatment plants for industrial and municipal sectors in the private domain, prioritizing reuse.
- Collaborating with investors, the Ministry of Investment, the Ministry of Industry and Trade, and other relevant entities to scout for investment opportunities in the development of decentralized wastewater treatment plants, with an emphasis on the reuse potential of treated water.
- Seek out and capitalize on opportunities to utilize unconventional water resources in industrial environments, such as utilizing treated wastewater and rainwater harvesting. Begin dialogues with appropriate authorities and the industrial sector in Jordan to facilitate and champion the uptake of these non-traditional water sources.

Undertake studies to assess the practicality of applying research findings and prospects concerning the recycling of wastewater near treatment facilities. Formulate and amalgamate operational strategies into the broader strategic plans of the Ministry of Investment, the Ministry of Industry and Trade, local municipalities, and other essential participants.

Develop water efficiency excellence certification for the industrial facilities.

- Fostering collaborations and establishing water efficiency certification standards across multiple industrial sectors while using the water consumption benchmarks, best practices manual, and outcomes from water audits as guides.
- Announcing and launching the certificate in its first pilot cycle.
- Building partnerships to support and fund future certification.





To successfully implement initiatives in this Road Map, an enabling environment must exist to support the initiatives' sustainability. execution and The approach must engage stakeholders, including government institutions, local communities, industries, individuals, farmers, the private sector, and support services providers. Effective demand management and enforcement additionally require the establishment of robust policies, tools, initiatives, and systems.

The Road Map's initiatives play a pivotal role in tackling the issue of poor availability of accurate information on water demand for industries. The initiatives also aim to promote the availability and adoption of efficient water-saving technologies, practices, and measures.

This involves identifying financing mechanisms and incentives for companies, individuals, farmers, and industrialists. Additionally, the initiatives focus on the creation of labeling schemes for appliances and fixtures that are efficient in water consumption; fostering community participation, behavior change, and capacity building for institutions and individuals; and utilizing appropriate legislative tools to curtail water wastage. Accomplishing these initiatives and goals requires effective public-private partnerships within an innovative environment capable of keeping pace with development and adapting to water scarcity conditions through efficiency, which has become the most important feature of economic progress.

The Strategic Objective

Develop legislative, financial, technological, cognitive, and behavioral change instruments to empower the water demand management supportive frameworks (enabling environment), through the five initiatives listed below:

Improve the availability, accuracy, accessibility, and sharing of information related to water conservation/ demand management at the national level.

- Forming a national team comprising key stakeholders tasked with reaching a consensus on identifying essential information and its availability related to water demand management.
- Creating mechanisms for collecting, auditing, reviewing, and approving water demand information.
- Facilitating national-level information sharing by either establishing a dedicated platform or integrating it into an existing one.



Promote positive societal behavior related to water use efficiency and conservation and building the capacity of relevant institutions.

Areas of work include:

- Developing collaborative initiatives between the Ministry of Water and Irrigation and private sector entities to launch awareness campaigns, implement water audit recommendations, and create and apply incentive schemes.
- Creating and rolling out campaigns to raise awareness about water conservation.
- Performing water audit procedures and acting on the findings.
- Establishing and promoting a distinctive branding for water conservation endeavors, integrating this visual identity into awareness campaigns.
- Crafting financial incentives in collaboration with private sector partners and government.

Develop or establish a policy/regulatory or legal framework for water conservation incentives (legislative, economic, knowledge).

- Identifying and approving the mechanism by which incentives will be developed and related partnerships built through the appropriate legislative framework.
- Clarifying the foundations for approving and managing incentives, implementing them, monitoring them, and linking them to measurable performance indicators.
- Activating legislation through developing incentives and educating those concerned about them.



Develop and launch a distinctive Jordanian eco-labeling scheme, signifying products designed for optimal water use efficiency.

Areas of work include:

- Developing technical standards aimed at enhancing water efficiency.
- Forming key partnerships critical for the successful implementation of the eco-labeling program.
- Recognizing and inaugurating the eco-labeling scheme for its application on water-utilizing products officially.
- Promoting awareness about ecolabeling and educating consumers on how to leverage eco-labeled water technology products to conserve water and optimize usage efficiency.

Develop a financing ecosystem for promoting innovation and expansion in water conservation programs.

- Incentivizing companies engaged in producing and distributing water-saving technologies to enhance the creation and delivery of novel and innovative water-saving products.
- Creating an ecosystem conducive to the formation of new enterprises dedicated to the development and distribution of water-saving technologies.
- Advancing the business operations of firms pioneering water-saving technological innovation.
- Generating a dedicated fund and pioneering alternative investment models through a collaborative public-private partnership, aimed at driving innovation in water-saving technology.

