



The Ministry of Water and Irrigation

Water Sector Policy For Demand Management

2023

[Version 2]



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for
Demand Management**

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This document is an integral part of the National Water Strategy and relevant policies and action plans.

1. National Water Strategy (2023 - 2040)
2. Water Sector Capital Investment Program (2023 - 2040)
3. Water Demand Management Policy
4. Energy Efficiency and Renewable Energy in the Water Sector Policy.
5. Water Substitution and Reuse Policy.
6. Surface Water Utilization Policy.
7. Groundwater Sustainability Policy.
8. Climate Change Policy for a Resilience Water Sector
9. Wastewater Management and Reuse Policy.
10. Action Plan to Reduce Water Sector Losses.
11. Water Sector Policy for Drought Management.
12. Water Sector Policy for Gender Inclusion.

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FOREWORD

Jordan is a nation burdened with extreme water scarcity that has always been one of the biggest barriers to our economic growth and development. This crisis situation has been aggravated by a population increase that has doubled in the last two decades alone because of refugees fleeing to Jordan from neighboring countries. We must then add to this the transboundary and climate change issues affecting Jordan's water supplies.

In the face of these challenges, and to achieve our goal of successful integration of Jordan's water resources management, the Ministry of Water and Irrigation has been active in putting forward four new policies that set clearly defined rules to manage the scarce water resources efficiently and sustainably. These new policies lay out the measures and actions required to achieve our national goals for long-term water security. These result-oriented policies are built upon and updated from previously adopted strategies, policies, and plans. Together, they are an integral and ongoing part of the overall management efforts that have already been achieved.

This policy is the result of the efforts of the working group to whom I am thankful. My team has been putting great efforts to enhance water governance that support these policies at all levels, which include enforcement of a suitable legal framework and regulatory tools, enhancing efficient institutional capacities, and supporting dynamic management plans that adapt the concepts of participation and decentralizations all under the umbrella of Integrated Water Resource Management which I am sure will show results in the near future.

Eng. Raed Abu Soud

Minister of Water and Irrigation

1 INTRODUCTION

Jordan is facing a serious water challenge. It has become one of the poorest countries in water worldwide, where water resources are not meeting increasing water demand. This drove the per capita water supply to drop dramatically in the past few decades, reaching less than 100m³/year/ capita, which is one of the lowest rates in the world.

Jordan is an arid and semi-arid region that mainly depends on fluctuating annual rainfalls. Reports show that rainfall has decreased by up to (15%) in the past few decades, mainly due to the effects of climate change.

Wars, conflicts, and crises in the region and neighboring countries exacerbated the water crisis as refugees fled to Jordan from several other countries - most recently Syrian refugees who are estimated to have reached 1.26 million people. This imposed tremendous pressure on all resources in the Kingdom, including water resources. Furthermore, population growth and economic development will increase demand for the already scarce resources, with recent statistics (2022) showing that the population in Jordan has exceeded 11.2¹ million people.

Other challenges facing the water sector include over pumping of groundwater, water losses due to illegal use of water resources and violations against water pipelines, and aging water networks suffering from wear and tear.

However, despite all the aforementioned challenges, Jordan is a leading example in water management for countries in the region. Potable water is accessible to around 96% of the population in urban areas, and 88% in rural areas. Furthermore, potable water is (99.3%) compatible with microbiological criteria. This is all thanks to the tremendous effort and distinguished performance of the Ministry of Water and Irrigation (MWI) and its institutions.

2 POLICY OBJECTIVES

The main objective of the Water Demand Management Policy, which was first approved by the Cabinet of Ministers in 2008, is to maximize the utilization of available water resources, limit water losses, conserve water sources, minimize commercial and technical losses, and promote the principles of efficiency through technical solutions, guidance and awareness, and advanced technologies to adapt with water scarcity and poverty and reduce the gap between available water supplies and increasing water demand.

Water is a vital and strategic resource and an essential input to everyday life and economic and social development. Therefore, the MWI's main goal is to promote the water sector; maximize utilization and revenue from available water resources; improve water management and sustainability; develop legislations and policies to regulate the water sector; and develop, monitor and implement action plans.

The Water Demand Management Policy is an integral part of the National Water Strategy and other policies developed or updated by the MWI. It is an important tool to change water usage methods and behaviors in alignment with the principles of sustainability, efficiency and equity.

¹Department of General Statistics, 2022

In light of the population explosion, the expected negative effects of climate change on rainfall rates, the increasing need to produce food, and intensifying competition between sectors for water, it is expected that water demand will increase significantly. Therefore, implementing the Water Demand Management Policy, following the best approach to protect and manage all water resources efficiently and effectively, expanding wastewater treatment, and developing new water resources will have a positive effect on the water sector currently and in the future.

This Policy addresses water management for all sectors, including the municipal (residential and commercial), industrial, tourism, and agricultural sectors, alongside other activities of national importance. As per the National Water Strategy, priority will be given to municipal uses, followed by the industrial and tourism sectors, and finally the agriculture sector.

In light of the challenges facing the water sector, it was necessary to make some amendments to the current version of the Water Demand Management Policy, provided that its implementation is monitored, and the Policy is reviewed at least every three years to be amended as needed.

Considering the unique features of water usage in the municipal, industrial and tourism sectors (which are connected to the water network), including the energy and mineral resources sector and the irrigated agriculture sector, the Policy will include three sections for these sectors in addition to cross-sectoral policy statements:

- One: The Municipal, Tourism and Industrial Sectors,
- Two: The Irrigated Agriculture Sector
- Third: Cross-Sectoral Statements

FIRST: THE MUNICIPAL, TOURISM AND INDUSTRIAL SECTORS

This section discusses several procedures and measures that guide the implementation of water demand management actions and programs to increase water usage efficiency and meet these sectors' demand across the country. Water usage in the industrial sector yields the greatest returns; therefore, this sector was granted special attention to maximize return on water usage, encourage local industries, and promote water use efficiency in the industrial sector.

Considering the needs of national strategic projects for water such as energy, mining, and oil shale for water, this sector will be divided into two sections:

A. THE MUNICIPAL, TOURISM AND INDUSTRIAL SECTORS (CONNECTED TO THE WATER NETWORK)

Construction, Metrology, and Standards

- All establishments using water across the country shall abide to using high quality water conserving plumbing fixtures to reduce water loss in buildings and facilities.
- Periodic monitoring in cooperation with concerned authorities in the country to update and amend technical standards stipulated by building codes, including the following:
 - Maximum water flow (liters/ minute) of all plumbing fixtures installed in new

buildings (less water usage and higher efficiency).

- All new buildings and facilities (municipal, tourism, and industrial) shall have water harvesting systems. The volume of safe storage shall be stipulated in building codes depending on the roof area and rainfall rates, to help secure an additional water resource that can be used for non-drinking purposes. A building code was issued and approved for the Greater Amman Municipality; however, this was not applied to other governorates².
- Implement campaigns to retrofit non-conserving plumbing fixtures and provide the most vulnerable groups with access to water conserving fixtures for free or at discounted prices.
- Encourage local manufacturers to manufacture water saving products.
- Support creativity and innovation in enhancing water usage efficiency and decreasing water loss.
- Taking into consideration Jordan's commitments in pursuance of its membership in the World Trade Organization and bilateral commercial agreements which prohibit allowing low quality non-conserving products into the Jordanian market.
- Adopting technologies that use less water in industrial and tourism products.

Non-Revenue Water Reduction

Commercial losses including illegal connections, poor planning and management, technical loss, and aging water networks with increasing water leaks, are the main causes of water loss. It is essential to take the necessary measures to reduce water loss, while taking into consideration the following:

- Enforcing laws and legislations in effect to restrict illegal water usage and connections, with stringent punishments and fees against violations, as stipulated in the amended Jordan Water Authority Law No. 22/2014.
- Monitoring the volume of water consumed in each sector and issuing bills according to actual consumption and prices to each user.
- Inspecting water meters periodically, keeping records to ensure their validity, and replacing them as necessary.
- Water facilities should be a leading example that encourages best practices in water usage and management. An efficient system for managing and maintaining water networks and implementing standard operation procedures should be developed and implemented.
- Rehabilitating the water network and infrastructure, including main pipelines and distribution lines to maximize transmission and distribution efficiency, minimize water loss, and protect water networks from pollution.

²Instructions on Water Harvesting Wells in All Zoning Areas for Licensed Construction Projects within Greater Amman Municipality, 2020.

Minimizing Water Loss

- Developing regulations and instructions to minimize water loss, such as limiting washing cars, sidewalks, passageways, and roads using water hoses; limiting the construction of decorative ponds and water catchments that do not contain pumps to reuse water or timed control systems; and monitoring the regular maintenance of residential plumbing to minimize leaks from faucets and plumbing fixtures and flooding of water tanks.
- Engaging young men and women, school and university students, and local community leaders in awareness activities regarding the consequences of wasting water and other related messages.
- Maintaining and expanding water auditing activities to monitor the quantities of water used in buildings and commercial complexes, measure and document actual water consumption, and determine if actual water consumption exceeds recommended water flow thresholds. This will help maximize water efficiency, minimize water loss, and encourage water conservation, since big commercial buildings and complexes are one of the largest water consumers in their sector.

Non-Traditional Water Sources

- Greywater can complement traditional water sources; however, regulations and instructions on implementing and using greywater systems are needed to ensure that they don't cause any damage to the environment or public health. Greywater usage should be restricted to irrigating residential gardens in rural areas that are not connected to the wastewater network and skyscrapers, commercial complexes, and projects with high population density, while taking into consideration effects on the wastewater network.
- Industrial water treatment and reuse technologies should be deployed in the industrial sector whenever possible, provided that product quality and quantity is not affected.
- Establishing water harvesting systems should be mandatory in the municipal, tourism and industrial sectors.
- Promoting innovation through scientific research and establishing advanced laboratories to introduce needed technologies.

Arid Landscaping

Continuing the arid landscaping program; learning from the program's accomplishments; and reviewing the principles and concepts of arid landscaping, to ensure water conservation in green landscapes, public parks, residential and commercial complexes, hotels, and resorts.

Scientific Research

Collaborating with research institutions to promote best water management practices in the municipal, industrial and tourism sectors. This shall be done by connecting scientific research to the water sector (new programs) and introducing water management to

university curricula.

B. ENERGY AND MINING SECTOR

Water Sources

- Water resources for this sector should not be from the network.
- A portion of the treated wastewater should be allocated for this sector.
- Groundwater extraction should be avoided if other water resources are available.
- Non-traditional water sources, such as rainwater harvesting should be utilized in this sector.

Legislation

- Adherence to project agreements, if they are listed among the investment promotion projects, such that the MWI supports these projects by providing them with water in sufficient quantities and quality.
- Reviewing and enacting water legislation.

Water Tariff

- Introducing the concept of water value, to achieve the highest return on each meter of water and taking into consideration cost recovery when setting water prices.

Research in Collaboration with the Academic Sector

- Collaboration with research institutes and centers to apply modern water conserving technologies.

Best Practices

- Contribution to improving the quantities and sources of water through parallel activities such as groundwater recharge, water balance and water harvesting.
- Introducing effective technologies to recycle used water.
- Water demand in this sector should not affect water allocations of other sectors.
- Protecting water resources, water streams, and valleys from pollution.
- Prioritizing water audits in this sector.
- Including water demand management in the assessments of projects' environmental, social, and economic impacts.

SECOND: THE IRRIGATED AGRICULTURE SECTOR

The agriculture sector is the largest water consumer in Jordan, therefore, the MWI and other concerned authorities, especially the Ministry of Agriculture and research centers, shall take all legal, institutional, technical, and economic measures related to water management and efficiency to achieve tangible conservation of irrigation water, sustain water resources while

achieving agricultural development, and provide an additional water resource for various sectors while preserving or increasing agricultural production.

This Policy includes the following actions regarding the irrigated agriculture sector to guide water management for agriculture across the country:

Water substitution and reuse

- Enacting the Water Substitution and Reuse Policy to manage scarce water resources efficiently, maximize benefits and returns of treated wastewater for non-drinking purposes and investments with high economic revenue, provide suitable methods and tools to store this water until it is used, and create a new water resource that can be used safely for irrigation in place of freshwater.
- Expanding the usage of treated wastewater for industrial and agricultural activities while taking into consideration that the quality of mixed treated wastewater and treated wastewater should be compatible with standards of the World Health Organization and the Food and Agriculture Organization not to mentioned Jordanian standards in the least, in order to be used without mixing in certain areas and achieve maximum benefits. It is expected that the volume of treated wastewater will reach 220 m³ by 2030.
- Expanding the use of modern technology, rehabilitating old treatment plants, and using modern treatment methods to ensure that the quality of reclaimed and treated wastewater is compatible with international standards. This will allow using treated wastewater without restriction as an additional source of water and revenue and increasing irrigation water supplies to expand irrigated agriculture and redirect freshwater for other uses. However, this should be done while taking economic, cultural, social, political, and environmental factors into consideration.

Water Efficiency in Irrigation

Limited water resources make it necessary to take all measures that ensure the efficiency of irrigation systems in cooperation with the Ministry of Agriculture, the National Center, the private sector, and civil society organizations, to increase productivity, reduce water consumption, and allow cultivating larger areas of land even in the years of water shortage.

This requires:

- Introducing optimal irrigation techniques and systems in terms of water efficiency.
- Preemptive maintenance of irrigation systems to help sustain water efficiency and reduce water loss from irrigation.
- Periodic monitoring of the efficiency of irrigation water usage during transmission and distribution and inside farms. Using monitoring data in planning and to determine the needs of crops in each farm.
- Implementing programs and procedures to ensure regular and stable water pressure in irrigation networks.
- Engaging the private sector in guidance regarding irrigation water usage in farms.

Water Harvesting

Reevaluating the expansion of water harvesting systems (dams, ponds, and any other water harvesting technique) across the country in pursuance of plans and studies of various regions and evaluations of the feasibility of any water harvesting project to ensure that it serves various purposes, and agricultural purposes in particular. Water harvesting is important for rehabilitating land ecosystems, promoting freshwater sources, creating new water resources especially in the Badia and desert grazing areas, recharging groundwater, mitigating flood risks, preventing soil erosion, and providing non-traditional water resource for cattle. The role of women should be considered in supporting residential water harvesting projects. Furthermore, the impact of these projects on women and their families should be considered, especially women who raise cattle, since these projects save women time and effort in watering house crops or cattle.

Research, Development, and Collaboration with the Academic Sector

- Supporting and encouraging applied research on the efficiency of irrigation water usage, with focus on water demand management in farms and maximizing revenue from each cubic meter of water.
- Utilizing recognized expertise at the local and international levels in using treated wastewater for irrigation.
- Encouraging shared research in introducing crops that can tolerate the high salinity of irrigation water and arid conditions and replacing crops that consume large quantities of water with crops that consume less water and have higher economic value.
- Developing irrigation methods in areas that suffer from water scarcity and low rainfall rates.
- Determining the water needs of all crops and agricultural systems across the country.

THIRD: CROSS-SECTORAL STATEMENTS

On Legislation and Institutional Frameworks

- Activating laws and regulations in force and updating and drafting legislations to apply best water usage practices in light of water status updates in Jordan to increase water efficiency, conserve water resources, and limit illegal water usage.
- Amend the Groundwater Management Regulations to set a new limit and quotas for agriculture in an attempt to reduce water depletion and keep water extraction within safe limits. Furthermore, implement a monitoring mechanism to ensure commitment to extraction licenses.
- Encourage and institutionalize local water administrations and councils to encourage participatory approaches and engage local communities with authorities to control water use violations, limit water loss, and efficiently manage water resources in general and groundwater in particular.
- Review and update legislations periodically to support modern practices in irrigation

water management along water distribution systems and inside farms.

- Review and update current legislations to include the role of water user societies and other entities concerned with irrigation water in Jordan. This should include clearly defining and institutionalizing the role of these societies in the water supply chain, the relationships between water user societies and authorities, and their tasks and duties.
- The MWI should continue its campaign to control water resources and take stringent measures against violations as stipulated in the Water Authority Law No. 22/2014.
- Continue using non-traditional water sources in irrigation and to substitute freshwater.

Water Tariff and Pricing

Water pricing is an important and integral tool to manage water demand and control and increase water usage efficiency in all sectors regardless of the water source. The MWI recently adopted the Energy Efficiency and Renewable Energy in the Water Sector Policy to limit consumption of traditional energy and rely on alternative energy sources in water supply systems. This would help reduce maintenance and operation costs and water loss. It will also reduce the energy bill, which would ultimately reduce water costs. The following factors should be taken into consideration:

- Price setting should take into consideration the interest of all stakeholders (suppliers and consumers).
- Water prices should be consistent with the revenues of each sector.
- Water tariffs should encourage optimal water usage, while taking into consideration social and economic factors in addition to accommodating low-income consumers.
- Various price tranches should be determined according to consumed water quality and quantity.
- Meters should be read regularly within a certain period of time, actual consumption should be mentioned in the water bill, and the bill should be issued immediately after reading the meter, to provide consumers with accurate information about their consumption and its cost.
- A reasonable price should be determined for mixed or treated wastewater under the Water Substitution and Reuse Policy to ensure cost recovery while applying cost saving innovations.

Awareness

- Continue national water awareness campaigns through mainstream media and other channels while focusing on water scarcity, responsibility to conserve water, and water use efficiency.
- Implementing continuous awareness programs and campaigns that target staff in all sectors (tourism, industrial, commercial, agricultural, etc.) to raise awareness on the importance of water conservation.

- Implementing leading and targeted programs to raise farmers' awareness on water demand management in irrigation, since a large portion of the water budget is allocated for irrigation.
- Apply best practices as stipulated in the National Water Strategy and encourage cooperation in providing integrated guidance services on irrigation that include how to use highly efficient irrigation systems.
- Raise awareness of farmers and well owners on the importance of groundwater to them, and the importance of using it efficiently, to achieve social and economic development goals and sustain our water resources.
- Promote the private sector's role in awareness campaigns on implementing the Water Substitution and Mixed and Treated Wastewater Reuse Policy in irrigated land in Jordan Valley.

Training, and Capacity Building

Developing the capacities of the water sector institutions and building the capacities of their human resources should be prioritized by:

- Organizing continuous learning and training programs (internal or external), especially those involved in managing water demand to gain more experience and connect with experienced and knowledgeable experts in the field.
- Technical training for operation and maintenance technicians in all water facilities and suppliers to reinforce their skills and competence in performing various tasks according to best practices in operation, maintenance, planning and management; and certifying them according to their respective fields of training.
- Building the capacities of water catchment committees (the Forum members) to enable them to participate in planning and managing the water sector.

3 INCENTIVE PROGRAM TO ENCOURAGE WATER EFFICIENCY

- Develop and implement incentive programs and plans to encourage purchasing water conserving appliances, tools, and technologies in the municipal, tourism, and industrial sectors. Incentives could include facilitated loans, grants, tax incentives, and customs exemptions.
- Implementing incentive programs and projects to introduce modern and advanced technologies in irrigation systems, including the provision of sustainable funding mechanism for long-term low-interest loans, tax incentives, and customs exemptions for water conserving irrigation equipment.
- Setting and applying incentives to encourage cultivating low water consumption crops with high economic returns.
- Applying a financial incentive and exemption system to establish water harvesting, greywater, wastewater treatment, and desalination projects.

- Develop a program to grant annual awards for the accomplishments of companies, institutions, and individuals in the field of water efficiency to encourage and promote the water conservation culture.

4 BEST PRACTICES

- Developing and implementing best practices in water demand management and water efficiency in all sectors. This should include programs, rules and regulations that guide various stakeholders on water efficient techniques and measuring key performance indicators on water demand management in alignment with updated strategies and the Economic Modernization Vision (2033).
- Reviewing guides regarding best water use practices in the irrigation sector and others, then update and reprint these guides, when necessary, in light of developments in the country's water status.
- Applying best practices in irrigation water usage including water extraction, transmission, distribution, storage, and management from the water source to farms.
- Replacing crops that consume high quantities of water with low water consumption crops that tolerate arid conditions and yield high economic returns.
- Reducing groundwater extraction for irrigation purposes to stay under the safe limit.
- Maximizing economic returns and revenue for each cubic meter of water used in all sectors and granting priority to water supplies for sectors with high revenues.

5 INFORMATION SYSTEM

Developing a central national information system for water use and water demand management and providing information to decision makers to determine optimal water allocations and protect water sources. It is essential to provide realistic estimates of water usage among various consumer groups to understand the effect of location and time of water use on the quality, availability and sustainability of current water sources.

6 WATER EXCHANGE

Study and evaluate water exchange between sectors to institutionalize a transparent, economically feasible, and socially acceptable water exchange mechanism, while taking into consideration the MWI Water Reallocation Policy. This mechanism should aim to reallocate water and determine a balanced formula for water uses that would maximize water returns and maintain food security.

