

A National Water Demand Management Policy

Introduction

In 1997, the Ministry of Water and Irrigation developed Jordan's Water Strategy and the following four policies, which include:

- Water Utility Policy;
- Irrigation Water Policy;
- Wastewater Management Policy; and
- Groundwater Management Policy.

The following two policies were drafted in 2006:

- Irrigation Equipment and System Design Policy
- Irrigation Water Allocation and Use Policy.

When used with current water supply management approaches, water demand management offers the prospect of greatly improved water resources management. A National Water Demand Management Policy needs to be developed to provide a framework for water demand management programs. Water demand management is briefly mentioned in Jordan's Water Strategy, which states that "resource management shall continually aim at achieving the highest possible efficiency in the conveyance, distribution, application and use" of water resources.

More specifically, in the demand management area, the Water Strategy cites the following:

- Achievement of the "highest possible efficiency" in water conveyance, distribution and use;
- Adoption of measures to "maximize the net benefit from the use of a unit flow of water";
- Definition and assignment of roles in water conservation to be played by the different sectors of society; and
- Promotion of systems and devices for water saving and water reuse

The Role of Water Demand Management

The idea of water conservation is not new to Jordan because in this region of low rainfall the people have historically had to survive by harvesting rainwater and minimizing their water usage. Given the general scarcity of water in the region, water demand management and water conservation will continue to play an important role in achieving sustainable use of freshwater resources in Jordan. The resultant water savings will provide monetary savings by reducing or delaying the necessary investments in water supply and wastewater disposal and saving energy.

As its main objective the Water Demand Management Policy is intended to result in maximum utilization and minimum waste of water, and promote effective water use efficiency and water conservation, for social and economic development and environmental protection. Sustained implementation of this water demand management policy will generate water savings that will be an important source of additional water to help bridge the gap between supply and demand and advance economic growth and social development.

The Water Demand Management Policy addresses the management of water demands in all sectors of Jordan's economy including municipalities, industry, tourism, agriculture and other activities of national importance. Many provisions of this policy are either under consideration or already in practice.

Given the specificity of the urban and irrigation sectors, the Water Demand Management Policy is presented hereinafter, in two components, one for the urban sector and the other for the irrigation sector.

A. In the Urban Sector

The urban component of the Water Demand Management Policy consists of the following statements, which provide guidance for the development and implementation of demand management measures and programs in all regions of the country.

1. On Instituting Water Demand Management

- Water demand management functions, responsibilities, and linkages in the urban sector shall be identified and instituted, and the role of each stakeholder in the supply chain shall be clearly defined.
- Present Legislation and regulations shall be reviewed and if necessary modified to institute water demand management functions in the urban sector.

2. On Codes and Equipment Certification

- Jordan shall include water use and water efficiency within the definition of national security to ensure technical specifications are enforced for all water using products.
- Jordan shall periodically update codes and technical regulations to require the lowest water use and maximum efficiency for all plumbing fixtures, appliances, and equipment while maintaining the intended performance. These regulations specify the maximum water use in liters per minute or liters per flush for all plumbing fixtures that are installed in newly constructed buildings.
- Technical specifications for all plumbing products such as pipes, tools, and other materials shall be adopted in Jordan because it will save large quantities of water by ensuring only high quality products are used, thereby minimizing water leakage in households.
- Programs should be established to replace all inefficient plumbing fixtures, appliances and equipment with the latest most efficient models.
- Jordan should actively promote the transition of local manufacturing to the production of water efficient products.
- Jordan should ensure that other important national initiatives, such as membership in the World Trade Organization, does not constrain the ability of Jordan to prohibit importation of inefficient or poor quality water using products.

3. On Reduction of Non-Revenue Water

- Existing laws shall be amended to clearly prohibit illegal use of water including procedures for disconnection and other appropriate penalties.
- Universal metering of water use is part of Jordan's Water Strategy. The accurate consumption of every water consumer should be recorded and billed in order to send the appropriate price signal and to correctly track actual consumption. Meters shall be periodically tested or replaced, and adequate records maintained, to ensure their accuracy.
- In order to encourage consumers to use water more efficiently, utilities shall set an example by demonstrating to consumers that they are effectively managing the water supply. Effective management should be demonstrated through adequate investment in leak detection and planned maintenance including repair and replacement programs. An effective maintenance management system and standard operating procedures shall therefore be developed and implemented by all water utilities.
- New technical specifications for utility water pipes and fittings shall be developed and adopted to ensure that only good quality materials are used for construction work.

4. On Water Pricing

- Establish a dynamic mechanism to structure water tariffs and increase cost recovery gradually to recover the cost of operation, maintenance, and depreciation
- Water tariffs shall be structured to encourage and motivate efficient water use taking into consideration low income consumers.
- Water meters shall be read in a timely and frequent manner and water bills should include consumption data and be issued periodically and immediately after meter readings in order to give consumers current knowledge of their water usage and send a clear pricing signal to the consumers.
- Best management practices should be developed, implemented and followed to reduce the cost of production and increase energy efficiency.

5. On Water Supply Augmentation using Rainwater Harvesting, Graywater and On-site Treated Wastewater

- Rainwater harvesting systems should be required for new construction (residential, commercial, industrial, tourism, etc). Rainwater harvesting can provide a non-potable water source that can augment existing water supplies.
- Plumbing designs for new residences and buildings should be changed to accommodate rainwater harvesting systems and safe storage for all structures; and graywater use for rural structures, not connected to a central sewer system
- Rural residences not connected to a central sewer system shall consider use of graywater for home gardens. Regulations need to be adopted to address any health and environmental issues that may be associated with graywater use. Graywater use could be supplemental source of water taking into account the impact on centralized sewer systems.

- On-site wastewater, graywater treatment and reuse shall be required for certain new commercial and residential developments. There are significant opportunities for treating and re-using wastewater on-site for high-rise and high-density buildings.
- Financial or tax incentives to encourage rainwater harvesting, graywater use and on-site treated wastewater use shall be implemented.

6. On Reuse of Treated Wastewater

- Jordan shall adopt a strategy of maximizing the use of treated wastewater for nonpotable water uses in urban areas.
- Treated wastewater shall be maximally reused for the highest available value purpose and storage shall be provided when the use of the wastewater is only required seasonally.

7. On Prohibition on Wasting Water

Regulations shall be implemented and enforced to prohibit water resources from being wasted in Jordan. Below is a list of some of the practices that result in the waste of water:

- Car washing with hoses,
- Ornamental ponds,
- Water features without re-circulating pumps or timers,
- Washing of sidewalks, driveways, and streets,
- Dripping faucets and other plumbing leaks, and
- Storage tanks that leak or overflow due to poor maintenance, and
- Single pass cooling.

8. On Comprehensive Water-Use and Water Demand Management Information Program

- A centralized national water demand management information program shall be developed to optimize water allocation and protect resources. Realistic estimates of water use for different consumer classes are essential for understanding the effects of spatial and temporal patterns of water use on the quality, availability and sustainable use of existing water resources.

9. On Education and Public Awareness

- Consistent with Jordan's Water Strategy, an ongoing public awareness and outreach activities, and school educational programs shall be implemented to increase and maintain high levels of public awareness of the importance of water efficiency.
- An annual awards program recognizing achievements of business, institutions and individuals in the field of water efficiency shall be implemented.

10. On Water Demand Management Programs

- The initiation, development and implementation of WDM programs shall be carried out by WDMU, utilities and other relevant institutions.

11. On Industrial Water Demands

- Regulations shall be developed and enforced requiring industries to use water more efficiently, recycle water within the industrial facility, use lower quality water

wherever possible, reuse treated wastewater for industrial processes wherever possible and adopt technologies that can accomplish the same production output with less water.

- Awareness programs that target workers and employees shall be implemented.

12. On Tourism Water Demands

- Programs to increase water efficiency in the tourism industry in Jordan shall be developed and endorsed. Such programs include efficient water use technologies, gray water reuse, rainwater harvesting and treated wastewater reuse.
- Water efficiency standards for new hotels shall be developed and endorsed. Retrofits of hotel buildings with water efficient technologies shall be mandatory.
- Awareness programs that target tourists and employees shall be implemented.

13. On Water-wise Landscaping

- Develop, implement and enforce regulations to ensure the adoption of water-wise landscaping principles for efficient landscape water use in public parks and spaces as well as by all retail water consumers (residential, commercial, hotels and resorts, etc).

14. On Water Efficiency Assistance for Low Income Consumers

- Assistance programs shall be developed and implemented to ensure low income consumers can afford water efficient products.

15. On Training and Capacity Building

- Water demand management training and capacity building programs shall be implemented for stakeholders in the water sector as an integral part of a water demand management strategy.

16. On Water Demand Management Research and Development

- In order to support the implementation of Water Demand Management, studies and research shall be conducted to support implementation of Best Management Practices.

17. On Best Management Practices

- Water Demand Management and water use efficiency Best Management Practices (BMPs) shall be developed and implemented. BMPs are policies, programs, practices, rules, and regulations that guide stakeholders to more efficient water use.

18. On Water Exchange Option

- A Water exchange option shall be evaluated, studied and established at the Ministry of Water and Irrigation to institute a transparent socially and economically viable mechanism for trading between water users, subject to MWI allocation policy considerations. This mechanism would encourage reallocation of water to users, and seek a balance between water uses that create higher value products per unit of water, and maintain food security.

19. On Financial Mechanisms for Improving Water Efficiency

Financial programs shall be developed and implemented to encourage offering products and services that improve water use efficiency. Such programs might include, but not be limited to, low cost loans, tax incentives, grants, and fee waivers.

20. On Key Performance Indicators

Key performance indicators for water demand management in the urban sector shall be developed and monitored to ensure compliance with National Agenda goals.

B. In Irrigated Agriculture

Water demand management in irrigated agriculture will lead to significant savings in the water sector. The MWI and other stakeholders shall undertake all necessary water demand management measures (economic, technical, and regulatory) to support more efficient use of water; and in turn help sustain or increase agricultural production. WDM in irrigated agriculture will also offer water savings that will provide additional supplies to the various sectors while preserving or increasing agricultural production.

The agriculture component of the Water Demand Management Policy consists of the following statements, which provide guidance for the development and implementation of demand management measures and programs in all regions of the country.

1. On Legislation and Institutional Arrangements

- Water demand management functions, responsibilities, and linkages in the irrigation sector shall be identified and instituted, and the role of each stakeholder in the irrigation water supply chain shall be clearly defined.
- Present Legislation and regulations shall be reviewed and if necessary modified to institute water demand management functions in the irrigation sector.
- Nonconventional water use in irrigated agriculture shall be instituted.
- Substituting Freshwater with Nonconventional Water shall be continuously pursued.
- Groundwater control bylaw shall be amended to include new quotas and bring abstractions to safe yield values.
- Groundwater Users Associations at the Groundwater Basin level shall be established. Participatory approach to ensure cooperation with decision making authorities in controlling and reducing abstractions shall be promoted.
- Legislation shall be reviewed and updated regularly to support advanced practices and technologies at the distribution and on-farm level.
- Legislation shall be reviewed to establish and legalize the status of water user associations or any other relevant associations involved in irrigated agriculture in Jordan, including clear definition of their role in the irrigation water supply chain. In addition, the relationship between water users associations and decision making authorities shall be defined and responsibilities delineated and instituted.
- An integrated irrigation advisory service shall be established to advise farmers on efficient irrigation water use and crop production in an integrated manner.
- Volumetric measurement of irrigation water use must be mandatory.

2. On Enforcement

- Enforcement mechanisms must be introduced to ensure efficiency and address illegal use of water.

3. On Water Pricing

- Irrigation water tariffs shall aim to cover actual operational and maintenance expenses and future rehabilitation and improvement of the system and provide incentives for water demand management and improved water use efficiency.
- Differential prices shall be applied to irrigation water to account for water quantity and quality taking into consideration the socio-economic aspects.

4. On Financial Mechanisms for Enhancing Water Use Efficiency

- Incentive programs and systems shall be reviewed, evaluated and developed to promote water use efficiency by farmers. Such programs might include the establishment of sustainable funding mechanisms to provide low interest long-term loans, tax incentives, grants, and fee waivers for efficient water use equipment.
- Incentives shall be developed and implemented to encourage low water consuming high-value crops.

5. On Best Management Practices

- Best Management Practices guidelines for efficient water use shall be developed.
- Highest economic return per cubic meter and sustainability of water use efficiency is the goal. Less-water consuming high-value crops to replace high-water consuming crops.

6. On Key Performance Indicators

Key performance indicators for water demand management in irrigated agriculture shall be developed and monitored to ensure compliance with national goals. Indicators shall include:

- Overall irrigation water use efficiency including extraction, conveyance, distribution, storage and on-farm ,
- Economic return per cubic meter of water used ,
- Reduction of over-abstractions of groundwater in irrigation to safe yield
- Replacement of freshwater with reclaimed wastewater as an indicator

7. On Implementing a Monitoring Program on Water Use Efficiency

- Irrigation water use and efficiency (on-farm, conveyance, and distribution) shall be regularly monitored for demand forecasting and planning purposes.
- Information and appropriate databases and tools shall be developed, regularly updated and made available to stakeholders.

8. On the Sustainability and Efficiency of Irrigation Systems

- Programs for preventive and corrective maintenance of the irrigation systems shall be adopted.

9. On Drought Management

- Drought shall be recognized as a natural phenomenon in irrigated agriculture sector. Drought management strategy and action plans including warning systems shall be developed.

10. On Technology Transfer and adaptation

- Irrigation water systems shall be upgraded to adopt advanced relevant technologies.
- Energy saving technologies and sustainable sources of energy shall be adopted and utilized as feasible.
- Appropriate programs, models, tools, and procedures shall be adopted, to ensure uniform flow discharge and stable pressure all through the irrigation networks.

11. On Training and Capacity Building

- Water demand management training and capacity building programs including training of trainers shall be implemented for all stakeholder levels in the water sector as an integral part of Water Strategy.
- Training shall be provided to upgrade skills of Operations & Maintenance (O&M) operators.
- Certification on “operation and maintenance” shall be established for O&M operators for the efficient management of the irrigation systems.
- Programs to increase farmers’ awareness and knowledge of water demand management and BMP’s including demonstration and outreach activities shall be implemented as an integral part of a Water Strategy.

12. On Research and Development

- Applied research on water use efficiency and integrated water use, soil and crop management within the overall economic-return per cubic meter will be adopted and promoted.
- Participatory research programs shall be developed based on the actual sector needs and shall target on-farm water demand management, use of brackish and treated wastewater for irrigation, and related best management practices.
- Irrigated agriculture shall use research-based WDM best management practices.
- Tapping into the recognized body of knowledge within and outside Jordan on salinity-tolerant plants and irrigation practices for water scarce environment shall be targeted.