Ministry of Water & Irrigation
وزارة المياه والري

Groundwater Sustainability Policy

2016

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

1. National Water Strategy 2016-2025.
2. Water Sector Capital Investment Program (2016-2025).
3. Water Demand Management Policy.
4. Energy Efficiency and Renewable Energy in the water sector Policy.
5. Water Substitution and Re-Use Policy.
6. Water Reallocation Policy.
7. Surface Water Utilization Policy.
8. **Groundwater Sustainability Policy.**
9. Climate Change Policy for a Resilient Water Sector.
10. Decentralized Wastewater Management Policy
11. Action Plan to Reduce Water Sector Losses (Structural Benchmark).

Ministry of Water and Irrigation

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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.

Water resources in Jordan are generated from surface water capture and ground water abstraction. The groundwater levels in Jordan's major basins continue to decline around 1 m/year. This is because we have had to rely heavily on groundwater abstraction in order to balance the available supply against rising demand.

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 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.

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Minister of Water and Irrigation

Introduction

Groundwater in Jordan is the most important source of water supply for all uses it contributes by about 60% of water supply for all uses, and it forms 79% of the municipal water supply in 2014.

There are 12 groundwater basins in Jordan which have been delineated based on hydrogeological studies and these basins are: Amman-Zarqa, Azraq, Yarmouk, Dead Sea, Hasa, Jafer Hammad, Jordan Valley, North Wadi Araba, South Wadi Araba, Sarhan and Southern Desert.

Groundwater resources in Jordan are classified into renewable resources which are recharged by rainwater and non-renewable resources (fossil groundwater) like Disi aquifer in the southern part of Jordan.

Renewable groundwater resources in Jordan suffer from depletion caused by over-pumping, particularly for irrigation uses in the High lands, the safe yield for groundwater pumping is estimated to be about 275 million cubic meters, while the quantities that were pumped in the year 2014 exceeded the safe yield by about 160 million cubic meters. Recent studies carried out by the Ministry of water and irrigation using remote sensing techniques revealed that there are additional 225 million cubic meters Groundwater is being used annually for agricultural purposes in the highland areas.

Taking into account the challenges faced by the water sector as a result of the ever increasing water demand due to population growth, refugees influxes, and the economic growth in addition to groundwater depletion coupled with the negative impacts of climate change, this situation requires that groundwater resources should be managed optimally and sustained for future generations. In this respect, groundwater sustainability policy is highly needed.

Management of Groundwater Abstraction

1. Sustainability of irrigated agriculture relying on groundwater is governed by socio-economic considerations that should be delineated into categories whereby a set of policy measures can be designed and applied to these various categories.

2. The agricultural sector's share of ground water resources shall be capped in favor of other sectors that show a higher economic return per cubic meter consumed.

3. Treated wastewater of quality meeting national standards and complying with public health requirements shall be increasingly used to replace fresher water resources.

4. Expropriation of use rights arising from legal use of groundwater, or of water rights established on springs from groundwater, reservoirs shall not be made without clear higher priority need, and against fair compensation.

5. Wells shall be closed against compensation for land value or water rights where their designation is zero or negative return.

6. Profitable properties for fund investments shall be designated where water efficiency and agricultural productivity would be used to achieve slower extraction over time.

7. Groundwater mathematical models shall be developed or updated for all regional aquifers of the basins to predict their yield under various pumping scenarios.

8. Recharge areas for aquifers shall be protected against pollution caused by whatever means such as solid and liquid waste disposal, mining, landfills, brine disposal, agricultural inputs and the like.

9. Protection zones for all groundwater recharge zones shall be delineated and monitored.

10. Cooperation with concerned authorities and other governmental bodies shall be undertaken to ensure that restrictions of protection zones are implemented and enforced (MoMa, LUA committees, RDEP/Rangers, etc.)

11. Appropriate water tariffs and incentives for groundwater abstraction used in irrigation shall be introduced in order to promote water efficiency in irrigation and higher economic returns for irrigated agricultural products.

12. Legislations pertaining to groundwater management are enforced equally on all well-owners. Strict measures that deter future violations shall be designed and enforced.

13. The National Water Master Plan shall include a comprehensive groundwater basin management plan for each aquifer.

14. The Highland Water Forum outputs shall be implemented utilizing resources from the Highland Water Fund.

Awareness

15. Jordanians are aware that water is a resource to be shared by all those living on Jordan's soil and that strategies related to the resource are national strategies rather than sector strategies.

16. Jordanians shall be well aware of water scarcity and the importance of conserving and protecting our limited water resources.

17. Participation of stakeholders and legislating for their involvement wherever necessary shall be introduced.

18. Lessons learned from participatory groundwater basin management committees consisting largely of water users and local communities shall be applied.

19. Farmers and well-owners shall be educated through various means about the value of groundwater for them and the wellbeing of the country for the sustainability of life, and for economic and social development.

20. Messages at multiple levels shall be prepared and disseminated to audiences on groundwater abstraction. The Highland Water Forum outputs shall be implemented utilizing resources from the Highland Water Fund.

Data Base and Data Collection

21. A comprehensive national water data bank shall be established and kept at MWI, and shall be supported by a decision support unit. It will be supported by a program of monitoring and a system of data collection, entry, updating, processing and dissemination of information, and will be designed to become a terminal in a regional data bank setup. Consequently, the Water Information System shall be re-engineered.

22. The monitoring system for groundwater resources already in place shall be supported.

23. The quality of groundwater shall be safeguarded by surveying and monitoring all water resources for water quality, and ensuring that water quality standards are consistently being met.

24. Continuous monitoring and data gathering shall be made of socio-economic conditions as well as changes in behavioral patterns associated with the use of water by different sectors in society.

25. Abstraction from all groundwater wells shall be metered, and monitoring of abstraction shall be made periodically to assure conformity with the provisions of the abstraction permits.

26. Data collected in the monitoring process shall be formatted for storage in and retrieval from computer files. Hard copies and computer backup copies shall be maintained at all times.

27. A Water Yearbook shall be produced incorporating all gathered data (groundwater levels, abstraction, rainfall, evaporation, spring discharge, etc.) along with a chapter on rights; the yearbook describes the water situation for each basin and is updated on a yearly basis.

28. Adoption of modern technologies for data collection, validation, analysis, modeling, sharing, and dissemination shall be expanded.

29. A special monitoring network of industries and olive presses shall be adopted and installed for those with potential pollution to groundwater.

Legislation

30. Laws in effect shall be enforced with due diligence. Periodically update legislation whenever necessary to respond to emerging needs including the needs for improving the acceptance of the water users of the implementation of the laws.

31. A methodology introducing compliance mechanisms for ground water quality with National Standards shall be adopted.

32. The campaign undertaken by MWI in August 2013, in enforcing bylaw 85(2002) and its amendments, shall be sustained.

33. Prohibition of well licensing for agricultural purposes shall be sustained, and incorporated in pertinent legislation.

Resource Investigation and Development

34. Groundwater use shall take place conjunctively with surface water in places where such joint use has the potential for increasing the available supply.

35. Withdrawal from non-renewable fossil aquifers shall be made carefully and after elaborate studies and investigations.

36. Compilation of oil and gas drilling data as well as geophysical data shall be made to gain better understanding of the potential of the deep aquifers.

37. The potential of brackish groundwater development should be continuously assessed in light of other users of this resource. That and the salinity anticipated in the deep aquifers should lead to properly embracing desalination technologies and understanding the energy component of such schemes.

38. Considerations shall be given to the enhancement of recharge and maximizing its potential both naturally and artificially. This should be built on the rich experience gathered within the MWI.

39. Actions should be pursued to collect intense precipitation (resulting from climatic changes) within the delineated recharge zone and allowing it to seep into the subsurface. Injection zones may also need to be delineated and the effort piloted.

40. Groundwater management action plans developed for Azraq Basin and Yarmouk Basin, with the participation of the local community and water users, as well as the one in the Jordan Valley, shall be implemented.

41. Implementation of groundwater exploration shall be conducted by MWI/WAJ personnel as a priority. This service can be out-sourced when deemed necessary or required by any partnership with others in this activity.

42. A contingency plan shall be made and updated for the purpose of allocating the water from privately operated wells for use in the municipal networks.

Institutional Concerns

43. Human resource performance shall be continually appraised to upgrade capabilities and sustain excellence. Incentives for excellence shall be introduced in compliance with the needs for dedication.

44. Logistics for the field teams shall be secured, and their working conditions improved to the best affordable levels.

Regional Cooperation

45. Cooperation with neighboring countries for the optimal and sustainable use and management of the shared groundwater resources shall be sought, preferably leading to a regional charter.

46. Shared basins shall be managed on the basis of an integrated approach (IWRM) not foregoing the need for regional cooperation to develop contingencies for droughts and impacts of climate change.

Policy Follow-up

47. Clauses of this policy document should be monitored on a yearly basis, and a relevant report should be prepared, a review is also warranted every three years, amendments proposed and acted upon.