



Seminar on Climate Change and its Impact on Water Problem in Jordan

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Introductory Remarks By:
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In the case of a country like Jordan which is considered to be one of the scarcest water countries in the world where annual per capita availability of renewable resources for all uses for the year 2021 is less than 100 m³ - which is far below the absolute poverty line, climate change impact will add more pressure to the already stressed resources putting the concept of sustainability in question. This severe water shortages situation has been recently challenged by the following:

- (1) climate change which simply means more water shortages and suffering from lack of water supply-a lifetime challenge Jordanians will most probably have to live and struggle with it for many years to come. Due to climate change impact, temporal and spatial rainfall will have a significant impact on the availability of water and the continuity of irrigated and rainfed agriculture with all associated negative impacts on water and food security. According to recent studies, the southeastern part of Jordan will lose by the end of the Century about 15-25% of the annual rainfall amount due to temperature increase and climate change.
The resulted high temperature rates, increase intensity of heat waves and the severity of drought, will definitely lead to high evaporation rates, increase water demand for the agriculture sector by about 18%. Such additional needed water supplies as a result of climate change, will not be compensated in anyway due to lack of affordable and easily accessible water supplies.
- (2) The MENA region including Jordan has the greatest expected economic loss from climate- related water scarcity, estimated at 6-14% of GDP by 20
- (3) Influx of refugees to Jordan from neighboring countries; the latest was the

Syrian refugees' crises (about 1.5 million refugee) increased demand by an overall increase of 22% with specific areas near the Syrian borders (four northern governorates) by 40%.

- (4) In addition to these external factors, there are many national elements and improper practices which accelerate the severity of water scarcity on our fragile environment i.e., excessive groundwater overpumping to cater for the demand increase because of crisis management during influx of refugees (5 times since 1948). This unusual situation led to ruined long-term planning of water sector.
- (5) No more easily accessible traditional water resources. Traditional urban water management facing increased water demand relied on large-scale water infrastructure projects to meet demand; however, these projects are environmentally, economically, and politically costly. Environment cost include over pumping of precious groundwater resources that either nonrenewable or support ecosystems (Disi and Azraq). Economic cost mainly related on distant and remote resources which increase cost of transportation and treatment with relatively high losses (Jordan Disi Pipeline 360 km). With most of water supply resources being transboundary, such projects can create political tension.
- (6) lack of needed financing as cost increase with water scarcity, new financing schemes did not enter the water sector as other sectors like electricity and telecom. Apart from some BOT projects there are no jump in financing schemes to bring in more money to the urban water development.
- (7) Affordability and cost recovery. Domestic water tariff among the highest worldwide with an average price of about \$ 2.0 for 1 m³ of water and wastewater services, where total cost is about \$ 4.0/ m³ (WAJ, 2018 data).
- (8) Efficiency, water losses and illegal uses is a major challenge to sustainability of urban water in Jordan.
- (9) A key challenge is to identify how new technological interventions can be channeled into pathways towards sustainable water security. Digital water transformation is well behind (NRW, automation, SCADA). In a survey done by the NEWF on the need for digital water in water utilities, 45% of the 300 from 120 countries participants reported the main barrier is the lack of financing. Not being able to push digital water to raise efficiency and cost effectiveness, will negatively impact water security.

To accelerate progress to achieve water security, the following are potential responses to achieve water security:

There is no “magic solution”, but in the case of Jordan, the sector been working on a bundle of measures, actions, and programs to alleviate water shortages, namely.

- (1) Demand management, water conservation and public awareness. Public and community engagement in resource management, and water operations is essential to increase efficiency.
- (2) Circulate water approach or one water cycle mainly demand management, water treatment and wastewater reuse are seen as major technological interventions that can address the increased pressure on water resources in the context of growing demand for freshwater for domestic and productive uses. Today Jordan reuses all its wastewater.

- (3) Increase efficiency in water uses in all sectors operations including irrigation, Jordan managed to reduce the allocation to Agriculture sector from 80% to 53% in the last 25 years, while not affecting the productivity, on the contrary, the agriculture sector managed to double or sometime triple the productivity. This was achieved by the implementation of strict policy for improving irrigation systems and shifting towards more advanced ones. Jordan's total water budget being around 1 BCM did not increase since the year 2006 despite completion of many waters supply projects, but the increase was offset by the reduction of groundwater yield, depletion, violation on transboundary resources and climate change.
- (4) Introduction of new financial schemes, as the major wastewater treatment plant of Amman and Zarqa which is serving about 2/3 of Jordan's population was done under a unique set up of BOT blended with donors' money to maintain continuity, sustainability, and reduction of cost to be affordable by customers of the plant (2002).
- (5) Work on IWRM and good sector governance to achieve sustainability as a long-term goal.
- (6) Increase water supply through desalination, wastewater reuse, water harvesting and groundwater.
- (7) This triggered the UN High Commissioner in 2016 to describe the water management in Jordan as achieving a daily miracle in serving Jordanians and Syrians. To tolerate the impact of Syrian refugees, a resilience and response plan has been prepared in collaboration with key donors.
- (8) Introduction of renewable energy (solar, wind, hydropower, and biogas) to reduce water cost. Today around 15-20% of energy use comes from renewables).
- (9) Regional cooperation throughout the Arab region to ease intra transboundary conflicts, transfer of knowledge and capacity building.