



Water degradation as challenges and vulnerabilities to human and health security in Jordan

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Water in Jordan



JORDAN

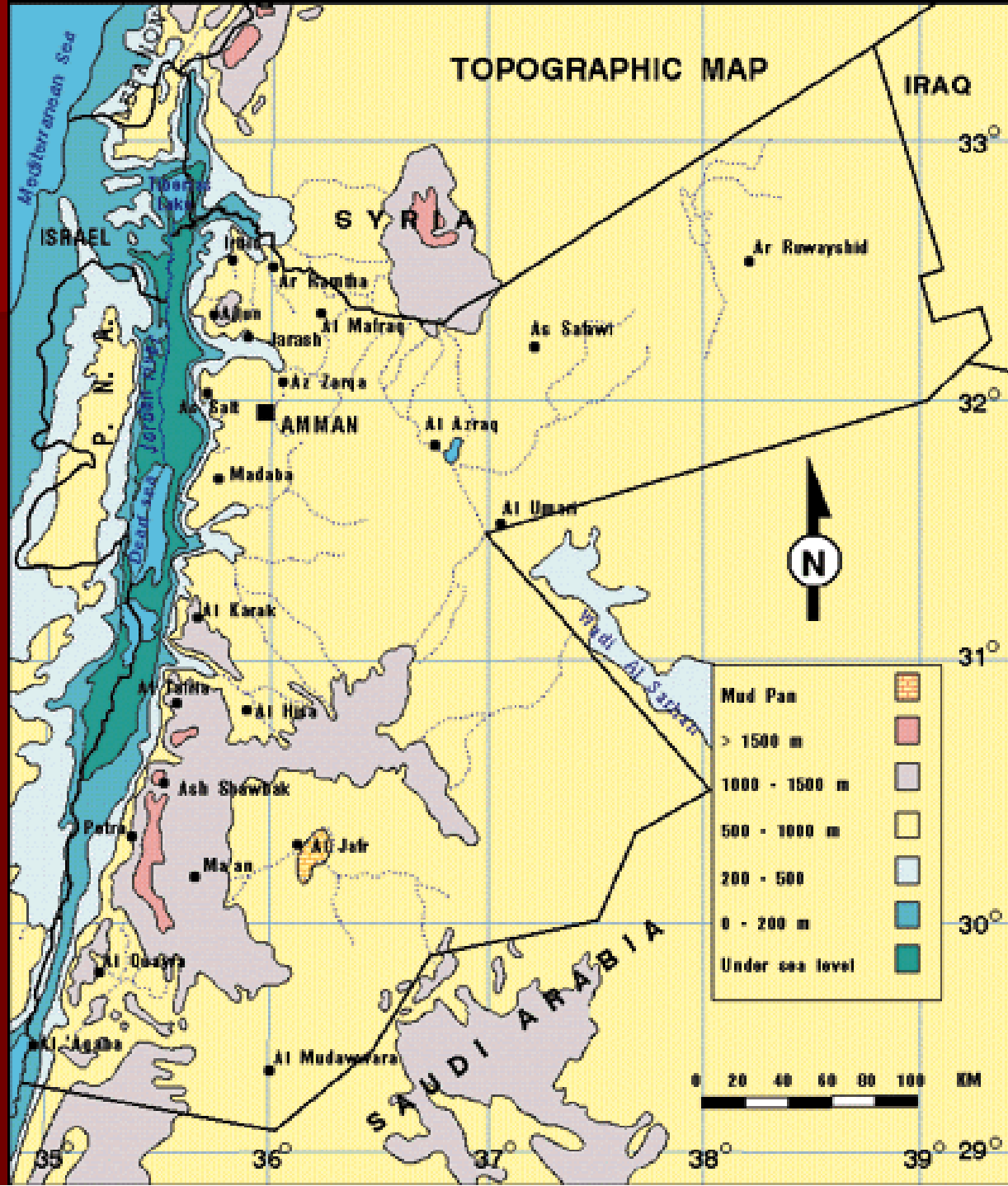
Jordan is known to be one of the most water scarce countries in the world, where water shortage has become of permanent nature, meeting water demands a challenge, and managing water resources imperative.

MWI site



Introduction

- Total area 90 000 km²
- Population: 5.2 M, growth rate = 3 %
- Jordan's climate is mainly semi-arid to arid.
- Only 4% of the country's total area receives more than 300mm/year of rain (the highlands).
Precipitation rates decrease drastically to the east and to the west of the highlands.
- The long-term average annual precipitation is 8,500 MCM, average per capita is 170 MCM, 92.5% is lost due to evaporation.



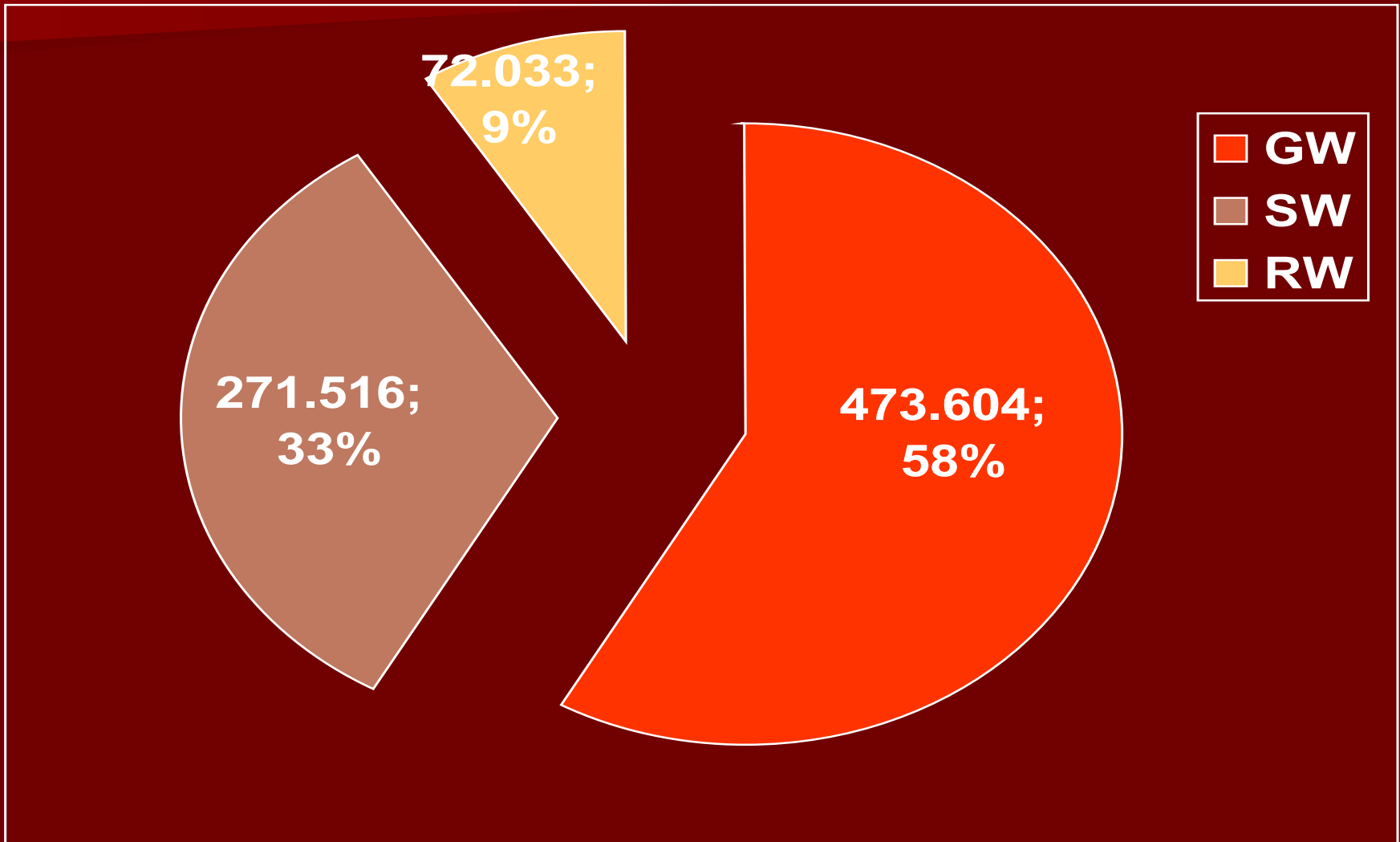


Water resources

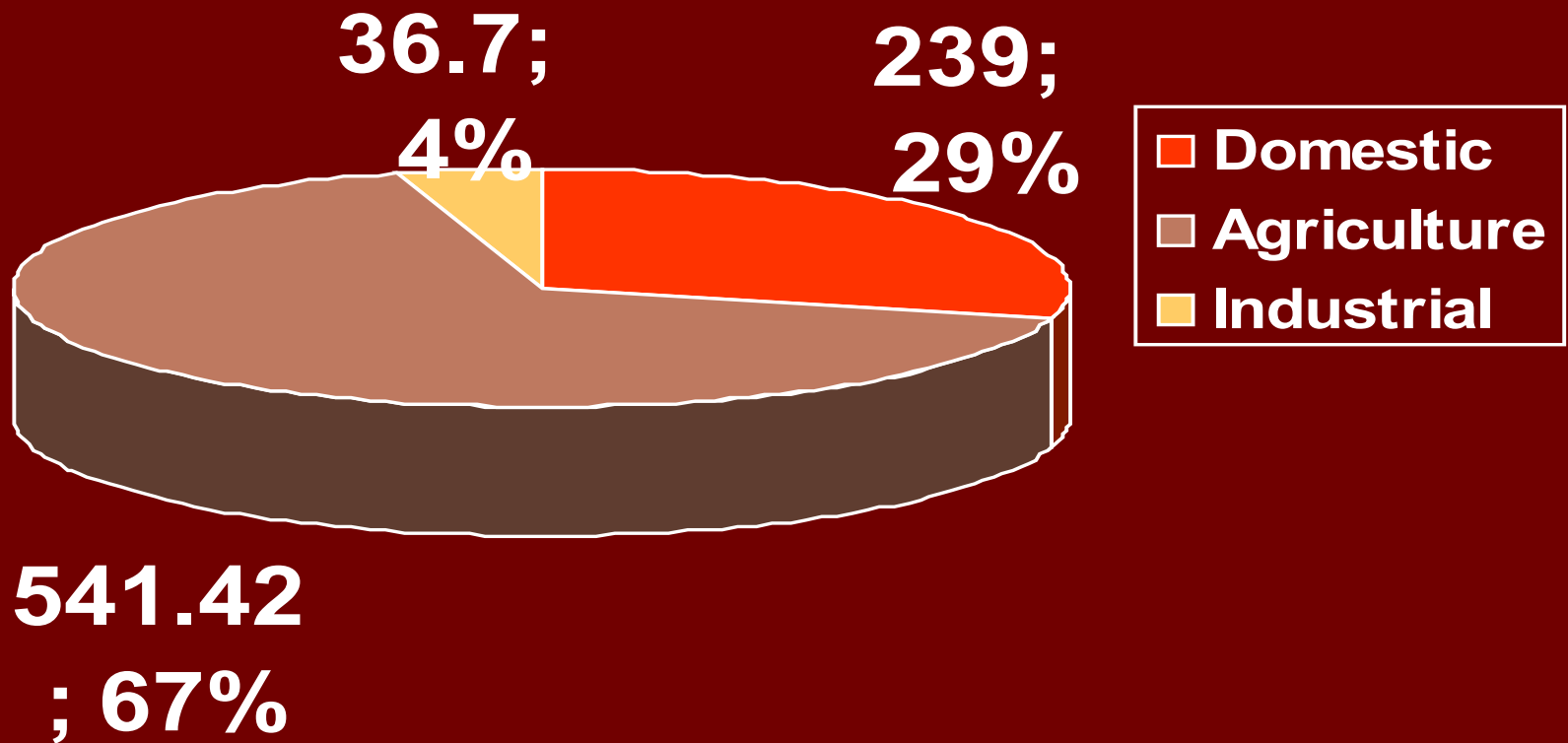
- Mainly Ground Water and Surface Water
- Renewable : 780 MCM/Y
(GW: 275 MCM/Y + SW: 505 MCM/Y)
- 143 MCM/Y from fossil water (underway)
- 50 MCM/Y from desalination (underway)
- Reclaimed water: 80 MCM/ Y
- Thus total available in the near future = 1048 MCM/Y

Sources of water used in 2000

Total 817 MCM i.e. (160 m³/cap)



Distribution in major sectors (MCM; %)





Projected demand (MCM/Y)

Year \ Use	2010	2020
Municipal	434	611
Industrial	99	146
Agriculture	904	890
Total	1436	1647

Population in 2020 is estimated at 9.2 million



Some issues of concern

- Over-exploitation ratio of groundwater sources is 185% in 2000, causing drawdown in water levels and **deterioration of water quality**.
- More than 95% of the population are served by domestic water network, however, **water is supplied once a week (24 hrs)**.
- 56% of the population are served by public sewerage network. **Unconnected households use cesspools**.
- 19 public domestic wastewater treatment plants treating 82 MCM (2000), all of secondary treatment levels. **Some plants are overloaded**.
- Reclaimed water is indirectly used for irrigation.



Impacts on water quality

- Due to over pumping to meet the demand, salinity has increased in a number of wells in the middle part of the Jordan.
- The incomplete coverage of the sewer system, impacted the quality of some spring; improper disposal of ww (in small communities).
- Due to lack of water supply, small communities tends to rely on nearby springs or streams, but these are **NOT** of appropriate quality.
- The WAJ urges the public to rely on the network for water supply as it is well controlled. It issues warnings not to use a number of springs that are not safe.
- Some water bodies are also impacted by the overload of dww and industrial activities such as Zarqa River Basin.



Water quality monitoring

- Therefore, a huge effort is being made to monitor the water quality.
- MWI; monitors the supply sources and the treatment plants.
- MoHealth monitors the water at the consumer.
- MoEnv: monitors impacts of activities on water bodies + some checks on supply and at consumers.
- Additionally, external party program is implemented to check quality and spot any changes (RSS).



Water quality monitoring

Major programs by RSS:

- National water quality monitoring project.
- Water Quality Assessment of King Talal Reservoir.
- WW Treatment Plants.
- King Abdullah Canal
- Real time monitoring system at 13 locations in Jordan.
- RSS reports immediately to the authorities and follows the actions with them.



WHO; health is not only the absence of disease but also *the extent to which an individual or group is able on the one hand to realize aspirations and satisfy needs and on the other to change or cope with the environment.*

An attractive simple definition of human health is the capacity for living.

Ch1: Ecosystem approaches to human health

N. Ole Nielsen,

Challenges and Strategies for Implementing the Ecosystem Approach to Human Health in Developing Countries, IDRC 2001.



Water & health aspects

- Off course the low per capita consumption (160 m³ / y for all uses) is a major concern; for domestic use the average is 130 l/cap/d.
- The quality of water is also an issue as indicated before (salinity + risk of contamination).
- If quantity and quality are to prevail at same practices or to drop down impacts on health would become more pronounced.



Major projects to respond

- Water conveyance from Disi aquifer / Aqaba to Amman.
- Red Sea – Dead Sea Conduit.
- Constructing new dams.
- Upgrading domestic wastewater treatment plants.
- Water desalination (brackish and sea water)
- Improving water supply network.
- Water conservation programs (agriculture and at large users).
- Reclaimed water reuse; treated domestic (black + grey water) and industrial.



More work

- Management of ecosystems.
- Water use efficiency in several sectors (industrial, tourism, agriculture).
- Aggressive water minimization and pollution prevention program is needed at the industrial sector. Work in that aspect has started by introducing *Cleaner Production*.
- There is a need to inject the *environmental economics* so as to appreciate the real value of the resource and the value of the impacts including (if not most importantly the health impacts). This can be an efficient tool for planning development activities.



Conclusions

- The shortage of water affects the quality of available resources; over pumping, higher strength ww.
- Water quality may also be impacted due to incomplete sewerage system and industrial activities.
- Aggressive projects are needed on the supply level, and on the ww management level.
- It is normal and very necessary to have large efforts in water quality monitoring.
- The water deficit together with the drop in water quality is a challenge for human health in Jordan.
- Efforts shall be directed to alleviate the problem through joint collaboration and assistance. The water sector has been the priority for the country and for International assistance, yet more work is needed; environmental economics and management of ecosystems.



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THANK YOU