SHARING KNOWLEDGE CONFERENCE 11

TO FACE A CHANGING WORLD

Jordan Water Sector Issues and Responses

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Why are we here today?

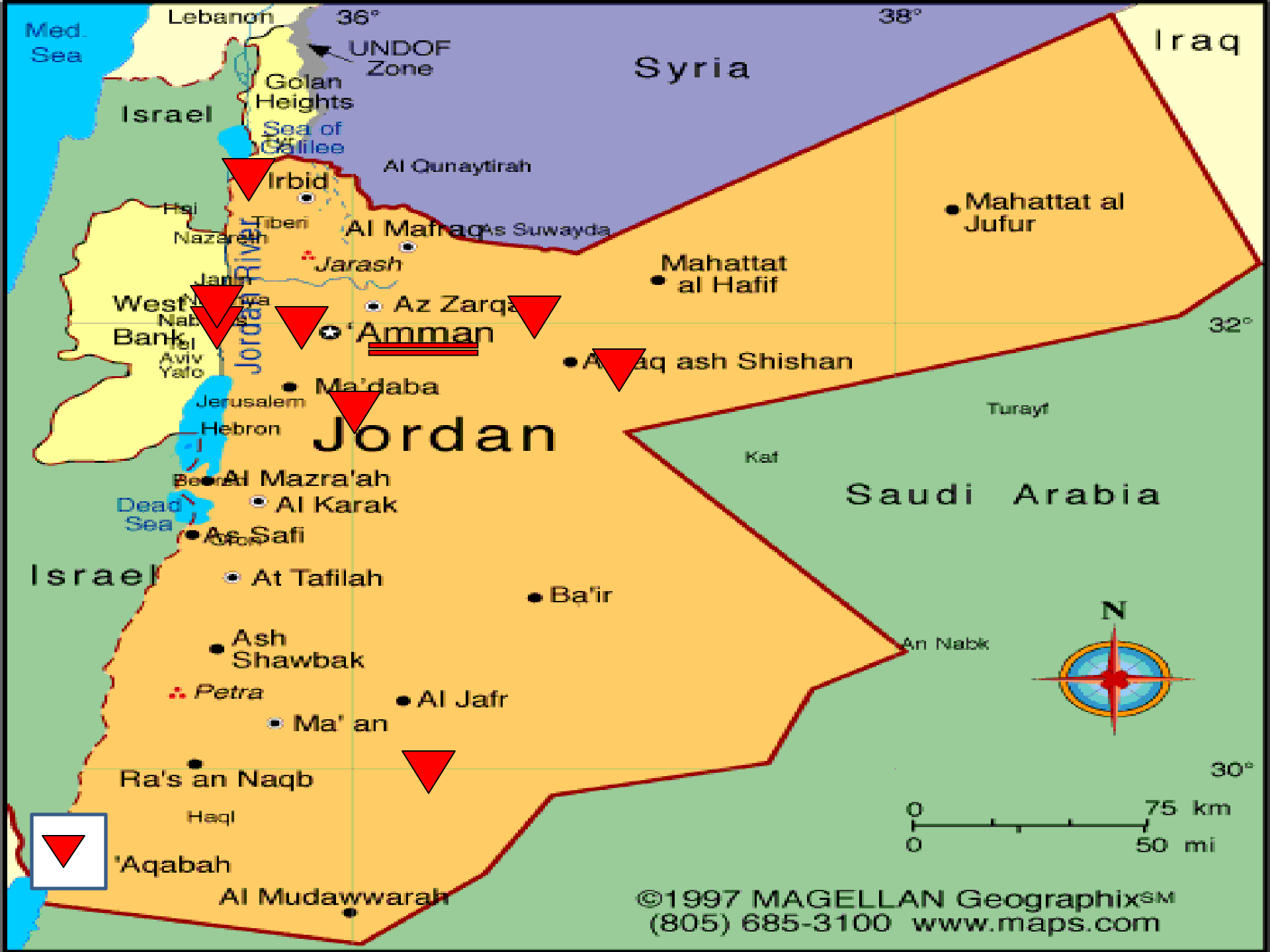
- To share knowledge about Jordan's water, food and energy sectors
- To remember that science can solve problems, and
- To confirm that information sharing, proper utilization of science and dialogue can bring peace

A group of experts and scientists with broad international experience are here to become acquainted with the situation in Jordan impartially and without bias

This represents an opportunity

WATER HISTORY CHARACTERISTICS

- Growth of cities and water needs
  - Water transport schemes
  - Population imbalance
- Quantity and quality issues
  - Drying up of streams
  - Treatment of waste


Med. Sea
Lebanon
36°
38°
UNDOF Zone
Syria
Iraq
Golan Heights
Israel
Sea of Galilee
Al Qunaytirah
Irbid
Mahattat al Jufur
Haifa
Tiberias
Nazareth
Al Mafraq
As Suwayda
Jarash
Jordan River
Mahattat al Hafif
West Bank
Az Zarqa'
'Amman
32°
Tel Aviv Yafo
Ma'daba
Jerusalem
Hebron
Jordan
Turayf
Kaf
Saudi Arabia
Al Mazra'ah
Al Karak
Dead Sea
As Safi
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30°
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DOMESTIC WATER (1)

- Though recently far beyond expectations, refugees and host communities issues and water sharing had always been the norm associated with the Kingdom's development challenges or rather impedance to its development
  - Establishment of Israel 1948
  - Arab Israeli War 1967
  - Lebanese Civil War 1975
  - Kuwait Invasion 1990
  - Iraqi War 2003
  - Syrian Civil War 2011

DOMESTIC WATER (2)

- Incremental supply of water has always been short of actual needs
- Population growth accompanied by urban concentration, such that Amman and Zerqa alone have more than half the country's population
- Water Authority of Jordan (WAJ) was established in 1988, entrusted with the provision of water and wastewater services and the management of water resources

DOMESTIC WATER (3)

- Successive loans taken to make water accessible to as much of the population as possible; by 1993, 97% of the population had access to piped water
- Water pipes were extended to cope with growth, but the networks were not structured to match horizontal and vertical sprawl nor to meet topographic and demand conditions
- Since expansion was given priority, maintenance was neglected and systems needed ever-increasing repairs, resulting in poor quality service, all with increasing debts

AGRICULTURE WATER

- In the 1940's, rainfed agriculture and food imports each provided about half of the nation's food. Irrigated production increasingly replaced rainfed and roughly an area of 1,500 m^2 of irrigated land per person was needed to maintain that balance. This area, in turn, required 1,400 m^3 of water, of which a continuously declining fraction was available. Hence the food trade deficit expanded continuously.
- There are two major areas for irrigated agriculture, each with a completely different set of issues – the Jordan Valley and the irrigated highlands
- Conveyance systems, always a major investment, were an obstacle to sharing the limited water among the subsectors
- Another obstacle was the absence of a regular system for shifting water allocations among uses

WASTEWATER

The decade between 1980 and 1990 saw access to wastewater services increase to 75% of the urban population and 52% of the rural population. Maintaining these percentages was always a challenge

HISTORY OF SECTORAL REFORM

- Reform started with the establishment of the Ministry of Water and Irrigation in 1993, with the hope of separating policy from operations
- Facing dilapidated networks, rigid centralized organizations, and inefficient operations, reform started with a concerted effort and surprisingly met limited resistance

RESPONSIVE ACTIONS (1)

- OMS activities including leak detection, well operation, GIS, customer base, etc.

  operational efficiency and improved utility performance
- Samra expansion, sewage network extension in addition to several other wastewater treatment plants

  environmental improvement and private sector participation
- Finalized the Disi project on BOT basis

  resource augmentation

RESPONSIVE ACTIONS (2)

- Doubled capacity of the conveyance system between Deir Alla and Zai, Jordan Valley to the Highlands ***water reallocation***
- Continued building a series of treatment plants for several sources which had become polluted ***environmental and increase in supply***
- Went through the process of awarding the Amman Management Contract and corporatization of utilities ***utility management, private sector participation, stakeholders dialogue***

RESPONSIVE ACTIONS (3)

- Primed the participation by preparing the books and other information to facilitate due diligence by private sector entities
  asset management and PS intervention
- Corporatized Aqaba Water
  institutional restructuring
- Led a broad campaign of human resource assessment and management
  human resource development
- Restructured the water tariff
  efforts towards cost recovery

RESPONSIVE ACTIONS (4)

- Worked with Donors and Multi-lateral agencies in the assessment of the Water Sector
  data validation
- Prepared a water strategy and policies
  charting sector course in a national perspective
- Formulated a comprehensive investment plan
  defining needs and priorities
- Enhanced the role of the PMU to oversee the Water Sector Investment Plan
  coordination mechanism among donors

RESPONSIVE ACTIONS (5)

- Groundwater protection scheme of basin units, metering, curbing licensing of new wells
  environment and resource protection
- Reactivated the Water Master Plan
  increased knowledge base
- Selection, calibration, and repair of domestic and industrial consumer meters for increased accuracy at low flow and moving towards smart meters
  increased revenue

RESPONSIVE ACTIONS (6)

- Samra went into operations with significant positive impact on the environment; also recently expanded
  further utilization of PPPs
- Ma'in Springs project went into operation; challenge was to maintain operational efficiency
  another form of PSP

RESPONSIVE ACTIONS (7)

- Rehabilitation of networks (primarily Amman and Zerqa) were completed but an additional phase of replacing tertiary and house connections remains pending
  hydraulic zoning was achieved and became a way of modus operandi
- Negotiations and legal disputes with well owners in the highland and in the Disi area were finalized
  the question of water rights addressed
- A new *National Water Strategy* and an associated *Action Plan* were formulated
  charting the future

KEY ISSUES

- Crisis management diverts attention from longer-term problems
- The significant role of energy in water
- Fees versus geographical areas
- Other perpetual issues:
  - NRW
  - Supply=Demand=Resources
  - Project prioritization
  - Cost recovery
  - Domestic vs. agriculture needs
  - Groundwater governance
  - Comprehensive national water law versus organization-specific laws
  - Public awareness

Thank you