The Egyptian-Dutch Advisory Panel
on Water Management

Integrated policies are a must to face future water scarcity in Egypt

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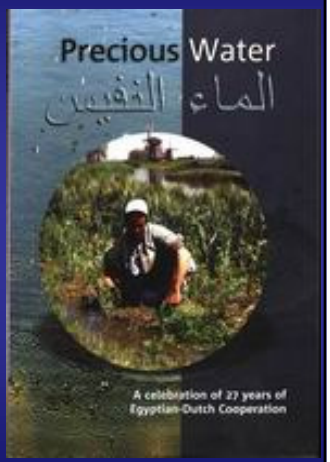
Outline

- Egypt, a gift of the Nile
- MWRI mandate
- Water challenges
- Egyptian-Dutch cooperation
- Investigation with scenario's
  - Population; Land use; Agriculture; Economy; Climate change; Water quality
- Integration of all factors
- Water Balance Conclusions
- Conclusions & Recommendations



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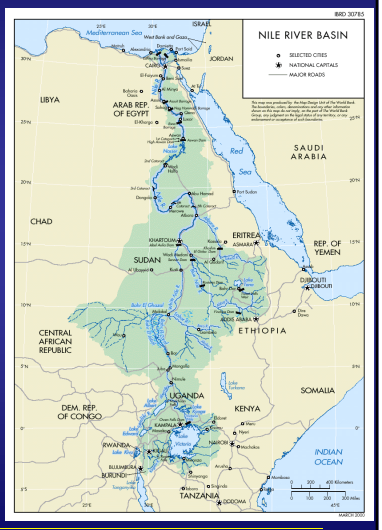
Egypt, a gift of the Nile

- Area basin 3: million km²
- Area swamps 70000 km²
- Nile River length: 6700 km
- 10 riparian States (> 250 M inhabitants)

1661 BCM Total Rainfall
55.5 BCM share of Egypt
35 BCM evapor. Sudd



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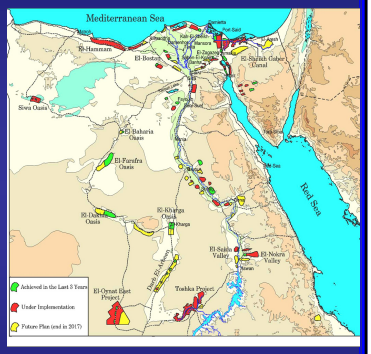
MWRI Mandate

Includes:

- Develop Egypt's water resources
- Manage the water resources efficiently and effectively
- Manage water quality



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Water Challenges

Egypt, like other arid countries, starts to face future water scarcity because of the following challenges:

- Population increase
- Agricultural expansion
- Development programmes
- Fixed share of water quota

Demand exceeds supply !

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Egyptian-Dutch cooperation/ APP

Objective:

… to assist, in an advisory capacity, MWRI in carrying out its responsibilities with regard to managing the water resources of Egypt more efficiently and effectively…

Egyptian-Dutch Advisory Panel on Water Management/ APP

Long term (1976-date) bi-lateral water cooperation, developed from technical to policy and institutional issues. Panel tools:

- Annual Meeting
- Annual Workshop(s)
- Working Group and Task Force Meetings
- Consultancy missions
- Training programmes
- Initiating projects (> 40 projects)

Leading to Implementable Recommendations

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Panel Structure

- Panel members (12, representing the sectors Water, Agriculture, Economy, Water Boards, Drinking water, Private sector, Research) and chaired by the Egyptian Minister for Water Resources and Irrigation, H.E. Dr. Nasr Allam
- Supported by an instrumental full-time Secretariat

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APP work on water scarcity

- 2002: Water Quality Management Unit
- 2004: Workshop Agricultural Water Demand Management
- 2005: National Water resources Plan
- 2007: Workshop Facing Future Water Scarcity
- 2007: consultancy study on required sectoral measures
- 2008: Consultancy on Climate Change Impact
- 2008: Consultancy on Drought management
- 2008: Consultancy Facing Future Water Scarcity
- 2008: **Policy Note** Facing Future Water Scarcity
- 2009: Consultancy on Water Awareness

This presentation based on all APP work

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Investigation with scenario's

From all APP work, different scenarios for water scarcity were developed on the basis of the following certain and uncertain factors:

1. Population & water availability
2. Land-use & expansion
3. Agriculture, water use, and food security
4. Economic development
5. Climate change impacts
6. Water quality management

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1. Population

- Pharaonic times: 2-3 million
- 1950: 22 million
- 2006: 75 million
- In 2050, depending on trends, between:
  - 120 million
  - 150 million

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1. Egypt's Water Supply

Almost constant:

- Nile River Flow: agreed share 55.5 BCM
- Rainfall (mainly north coast): 1.3 BCM

Other sources:

- Re-use of drainage water
- Rainwater harvesting, flash floods
- Groundwater (planned to increase in future)
- Desalination (planned to increase in future, but mainly in remote areas and for drinking)

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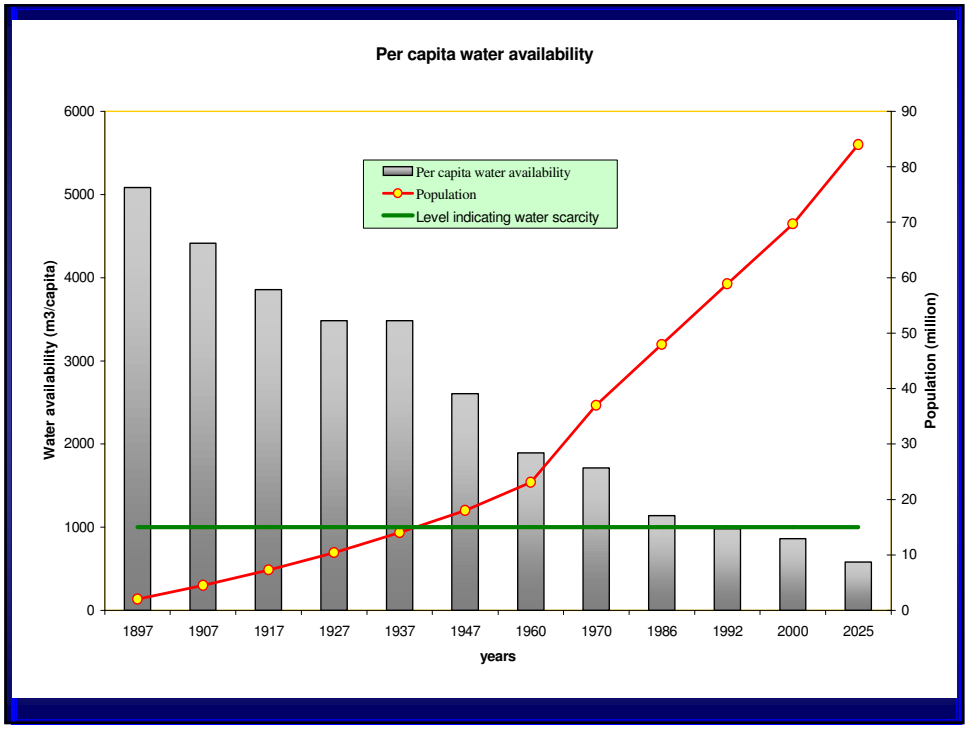

2. Land use

- 95% of the people live on 5.5% of the land
- Egypt faces urbanisation: 30.000-60.000 feddan of highly fertile land is lost annually

It is a challenge to keep the existing area agricultural land !

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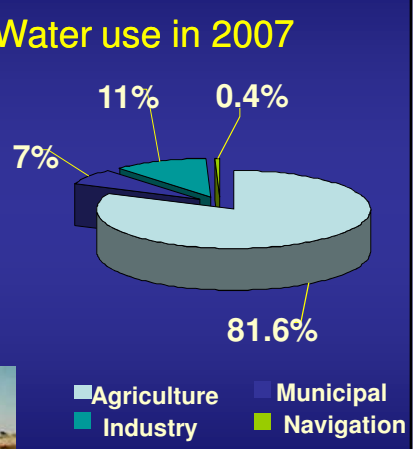
3. Agriculture, largest water user !



3. Water use priority

1. Drinking water
2. Industry
3. Agriculture (> 80%)

As the water availability is almost fixed, the largest water user, agriculture, will have to do with less water !

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4. Economy

Key parameters of the new economic policy of Egypt in 2003/ 2004:

- Ensure price stability in the short run
- Liberalise the economy, minimise government intervention
- Streamline regulation and simplify procedures
- Improve managerial efficiency through PPP's

Adaption should lead to improvements in economy

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5. Climate change impact

Summary:

- Increased risk of floods and droughts
- Sea level rise
- Higher evapo-transpiration due to higher temperature
- Higher water temperature:
  - impact on coral reefs (tourism) ?
  - More algae blooms ?

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5. Climate change impact

- Nile Basin sensitive to climate change:
  - 10% rainfall reduction --> 30% less stream flow !
  - 10% rainfall increase --> 30% more stream flow !
- IPCC scenario's: rise in temperature next century
- Likely impact:
  - Egypt's North coast: less rainfall
  - South part of Nile basin: increase in rainfall
  - More occurrence of dry and wet extremes

Sure is that the uncertainty increases !

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5. Dry and wet extremes

High Aswan Dam

- Future planning should include increases risk of floods and droughts
- Management of Lake Nasser water level has to take this into account

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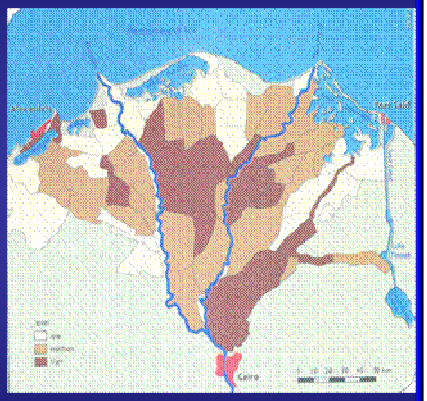
6. Water quality management

- Drainage system designed to receive land drainage water
- Drains become polluted due to dumping of domestic and industrial waste effluent, and agro-chemicals
- In the Delta, some drainage water is pumped into irrigation canals to mix and for use downstream
- Through APP, priorities for waste water treatment were identified, to fit with the re-use policy



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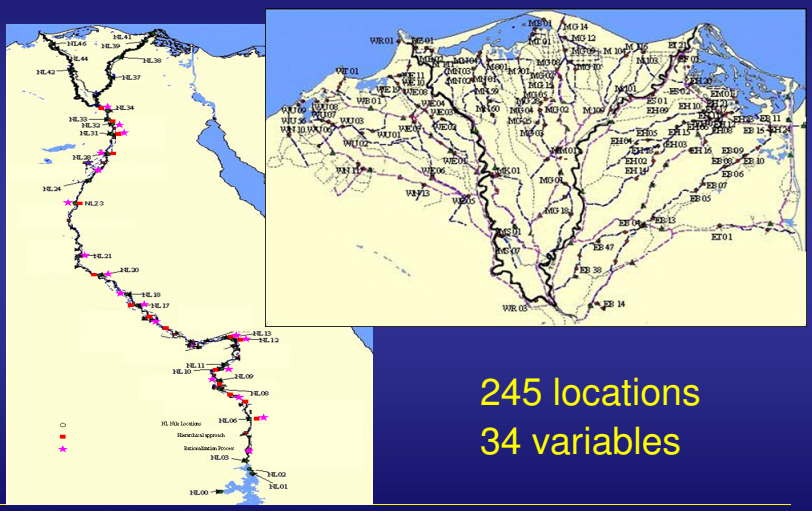
6. Water quality monitoring



245 locations
34 variables

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Integration of all factors

- Addressing water supply and demand challenges without full recognition of outside trends (population, urbanisation, economy, etc) is unlikely to be successful
- Water cannot be used efficiently and effectively without dealing with economic reforms outside the water sector
  (agricultural prices and subsidies; energy prices; public finance, trade and land market reforms)
- **Cautions: Food security is important; reforms need to be socially acceptable, etc.**

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Conclusions water balance

Item	1997	2017		Pess.	Trend	Optim.
Consumptive use agriculture	38.5	38.7		29.8	38.0	44.1

- Water for agriculture may remain stable, but can decrease (pessimistic) or increase (optimistic)
- Very limited possibility for more cultivable area
- Productivity may/ should increase, but food security may require imports

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Overall conclusions

- Water scarcity is not an issue of MWRI alone
- Other Important Ministries:
  - Population
  - Agriculture and Land Reclamation
  - Housing, Utilities, and Urban Communities
  - Finance
  - Industry
  - Etc.
- **need for integrated policies**, with all Ministries taking water (scarcity) into account

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Recommendations

- Integration of policies
- Implement the prepared “Water Awareness” Action Plan
- Research should answer the many questions:
  - how to distribute water (shortage) more effectively
  - how to increase water productivity
  - how to deal with wet and dry extremes
  - etc., etc.
- Learn from other Delta’s with similar issues
- Prepare a “Water Scarcity Action Plan”

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