



**Working Group on Use of Poor Water quality for Irrigation  
(WG- PQW)**

**Egyptian Practice and Experience of the Reuse of Non-conventional Water  
Resources**

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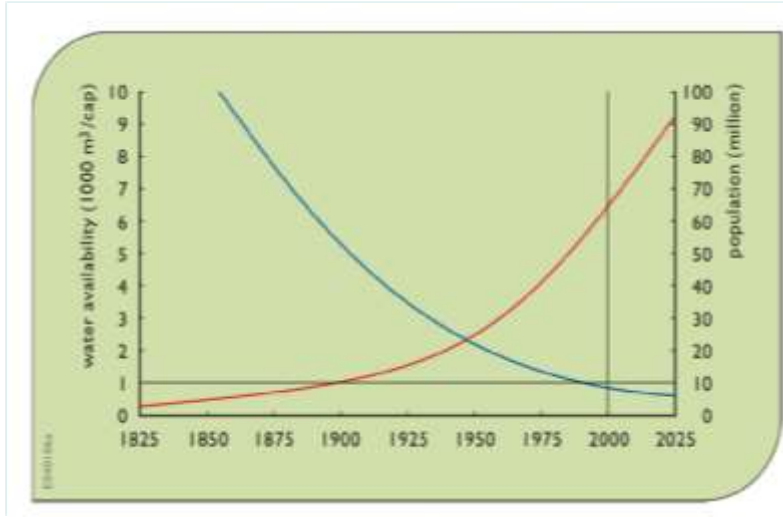
**Objective**

- Focus on introducing the wastewater reuse practice and challenges in Egypt

**Contents**

- Needs for reuse
- Drainage Pattern in Egypt
- History Wastewater Treatment and Reuse
- Potential Quantities of Wastewater for reuse
- Management Tools of Wastewater Reuse
- Regulations & Legislation
- Challenges

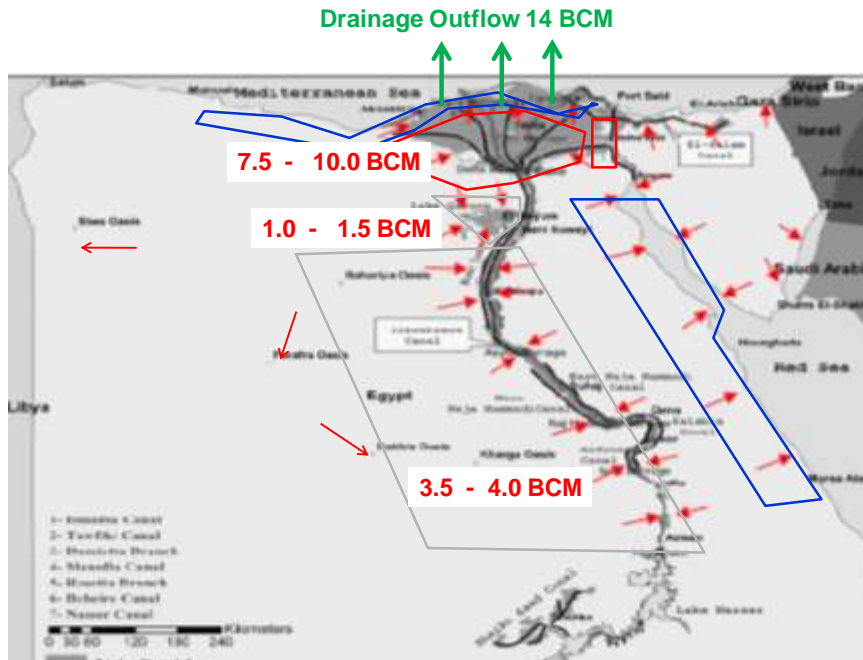
## Water scarcity



## Needs for Reuse

- Water resources in Egypt are limited as Egypt is mostly a rainless country.
- A gap between fresh water resources and the country's requirement already exists 6 BCM/year.
- The possibility of increasing the fresh water resources from conventional sources is doubtful.
- Potential Reduction of Egyptian Water Quota

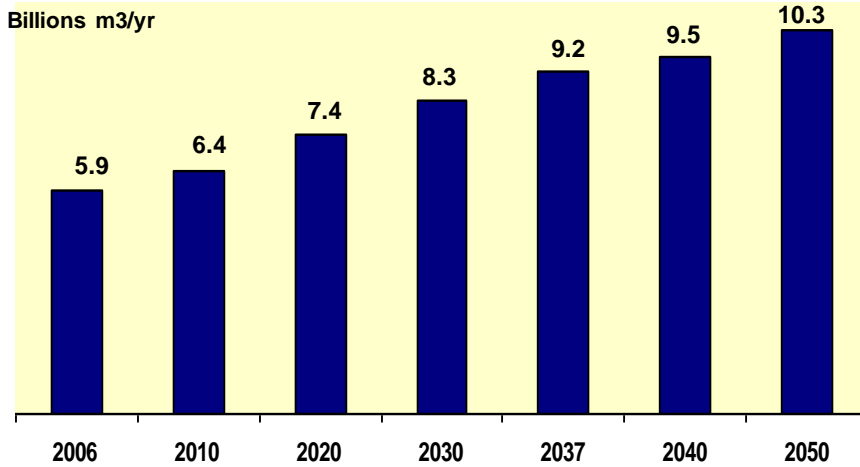
## Drainage Water Reuse Practice: 15 BCM year



## History Wastewater Treatment and Reuse

- ❑ Reuse of sewage, after primary treatment, in agriculture has been in practice since 1911 (Gabal Al Asfar farm: 3000 feddans)
- ❑ Yet, experience of large scale, planned and regulated reuse project is still limited
- ❑ Large-scale pilot projects (167 thousands feddans)  
East Cairo - Abu Rawash - Sadat City – Luxor – Ismailia
- ❑ In the mean time most of the sewage water drained to the agricultural drains is actually reused in one way or another

**Wastewater Quantity according to the Egyptian Code**



- Quantity of Wastewater according to Egyptian code is 80% about of water quantity

**Treated Wastewater Reuse**



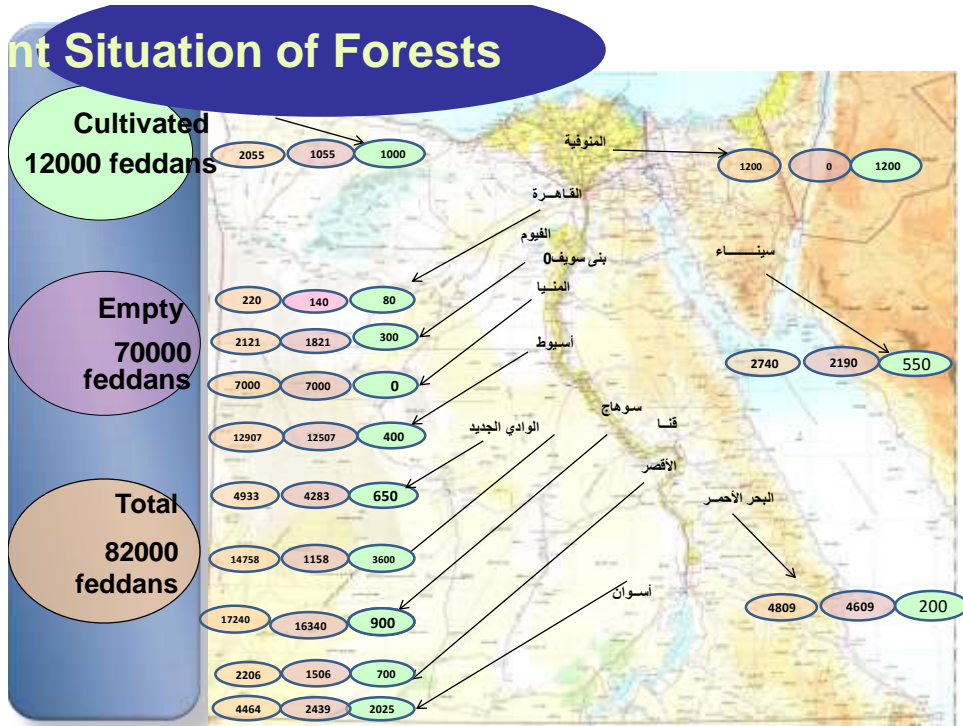
The amount of wastewater is **6.5 Billions m<sup>3</sup>/yr**  
(which 850 thousands feddans)

About **3.65 Billions m<sup>3</sup>/yr** is wastewater

About **2.85 Billions m<sup>3</sup>/yr** of wastewater is not treated (about 5% of Nile share)

**20% Primary treatment**

**80% Secondary treatment**



### Some Ideas & Horizontal expansion Plan

- Sustain present practice
- Code limitation
- Law 48 Restriction
- Institutional Set up
- Matching Plans



## Management Tools of Wastewater Reuse

### □ Field Trial

- ❖ Field trials were carried out in summer 2000 and winter of 2000/2001 on two sites located about 20 km North-East of Cairo.

### □ National Codes and Legislations

- ❖ The national legislation on effluent reuse has also been recently revised by Decree 44/2000 to bring the standards for effluent quality and conditions of reuse inline with those adopted internationally.
- ❖ Updated Code of 2014 for irrigation

### Field Trial



## Challenges in WWT and reuse in Egypt

### Treatment & Reuse

- Technical
- Economic
- Social
- Institutional
- Capacity Building
- Legislation & Enforcement

### Technical

#### Priority of Wastewater Treatment Components ?

- 40% for the sewerage system
- 20% for lifting pump station
- 40% for the treatment works



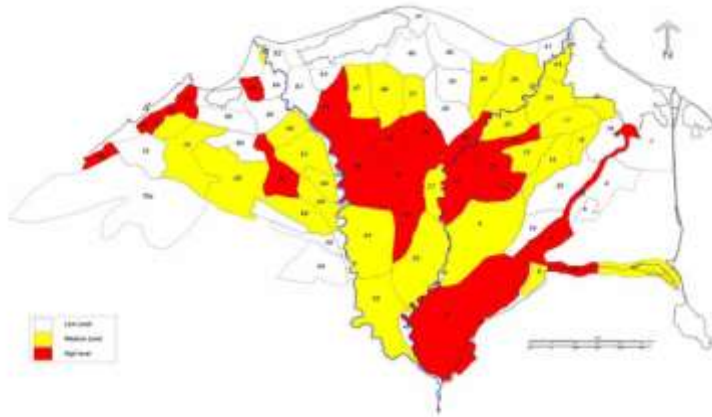




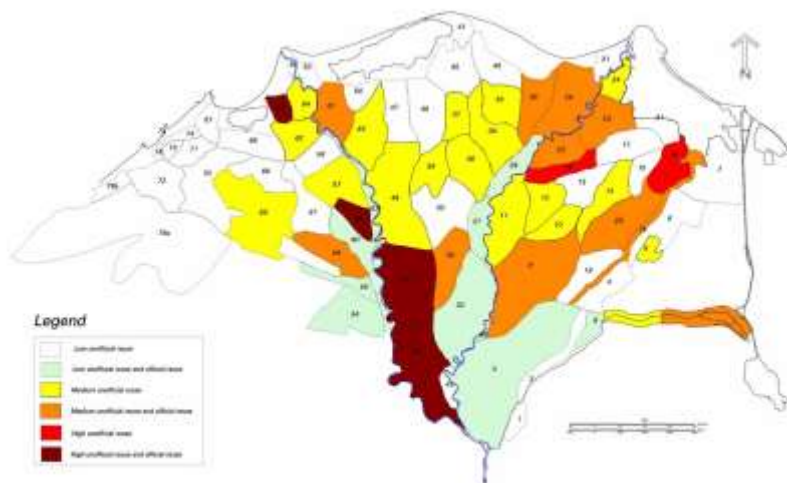


## Priority Areas in the Nile Delta ?

- Population density
- Health risk due to pollution level
- Catchment of drainage water reuse projects



Pollution levels in the Nile Delta



Catchments in the Nile Delta with Official and Unofficial Reuse

## Position of Reuse scheme ?

- Reuse scheme following the sanitation Scheme
- Reuse part of the sanitation Scheme



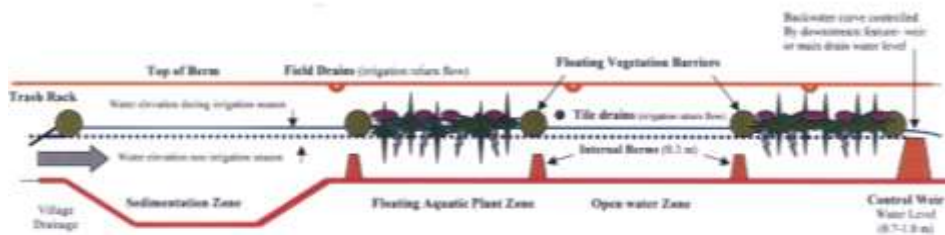
## Limited uses of treated wastewater (Egypt)

- **Agricultural Irrigation**
  - Crop irrigation
  - Commercial nurseries
- **Landscape Irrigation**
  - Parks
  - School yards
  - Highway medians
  - Golf courses
  - Cemeteries
  - Residential
- **Industrial Recycling and Reuse**
  - Cooling water
  - Boiler feed
  - Process water
  - Heavy construction
- **Groundwater Recharge**
  - Groundwater replenishment
  - Saltwater intrusion control
  - Subsidence control
- **Recreational/Environmental Uses**
  - Lakes & ponds
  - Marsh enhancement
  - Stream-flow augmentation
  - Fisheries
- **Non-Potable Urban Uses**
  - Fire protection
  - Air conditioning
  - Toilet flushing
- **Potable Reuse**
  - Blending in water supply reservoirs
  - Pipe-to-pipe water supply

## Priority Actions to Enhance Reuse Potential

- WWTP Scheme should include reuse component
- Separation of industrial effluent disposal systems
- Provision of collection stations for the vacuum trucks (rural areas)
- Search for simple low cost treatment technology
- Horizontal agriculture expansion project based on reuse of treated sewage
- Involvement of Private sector and public participation
- Awareness of the health risks involved with direct or indirect contact with the treated wastewater reuse
- Update the reuse standards and code of practice in way to be applicable

## In-stream Wetland





**Floating aquatic plant plantation**



**Final screening and drain bank protection work**

## **Challenges in WWT and reuse in Egypt**

### **Treatment & Reuse**

- Technical & Implementation**
- Economic**
- Social**
- Institutional**
- Capacity Building**
- Legislation & Enforcement**

**Most important Challenges for Egypt Case (Priority) ?**

**Thank You**