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Drainage Water Reuse Strategic Options and Measures to Alleviate Risk of Failure, Egypt

Ashraf El-Sayed, PhD

ashsayed@hotmail.com

National Water Research Center, MWRI,, Egypt



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Contents

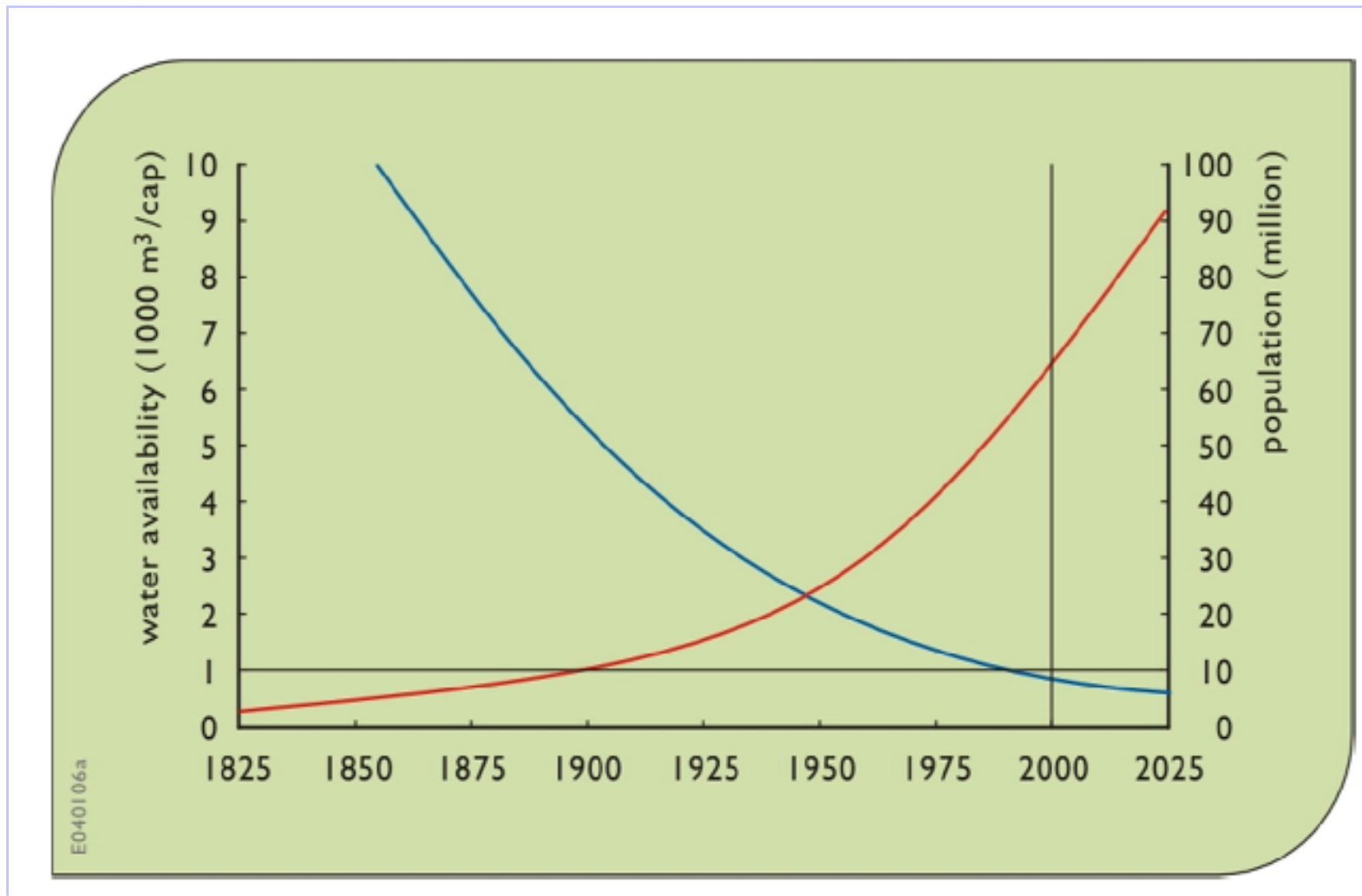
- **Needs for Reuse**
- **Drainage Pattern in Egypt**
- **Drainage Water Reuse Practice**
- **Management of Drainage Water Reuse
Regulations & Legislation & Monitoring**
- **Drainage Water Reuse Issues**
- **Measures to Alleviate Risk of Failure**



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Needs for Reuse



Needs for Reuse

- **Water resources in Egypt are limited**
- **A gap between supply and demand already exists over 6 BCM/year.**
- **Possibility of increasing water resources from conventional sources is doubtful.**
- **Potential reduction of Egyptian Water Quota**

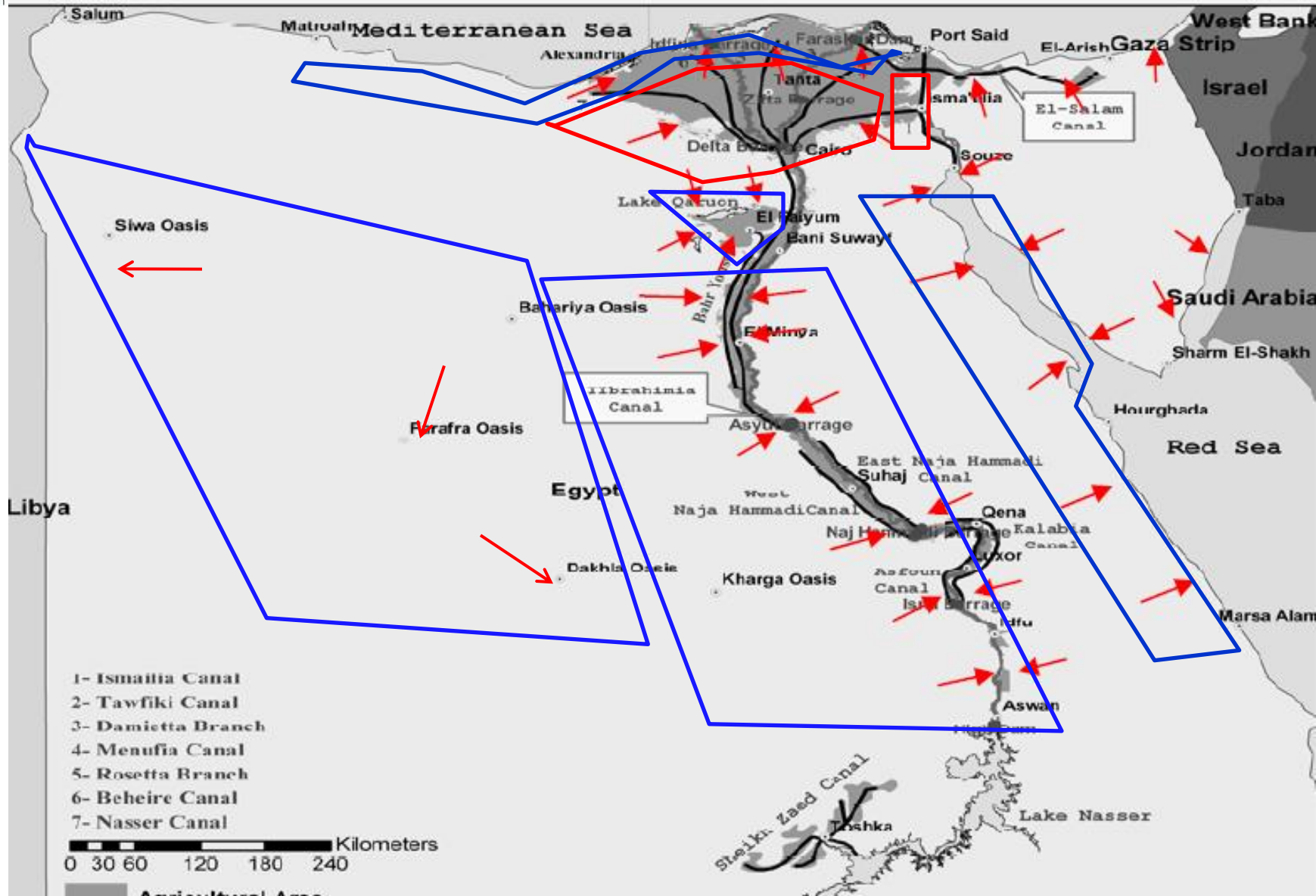




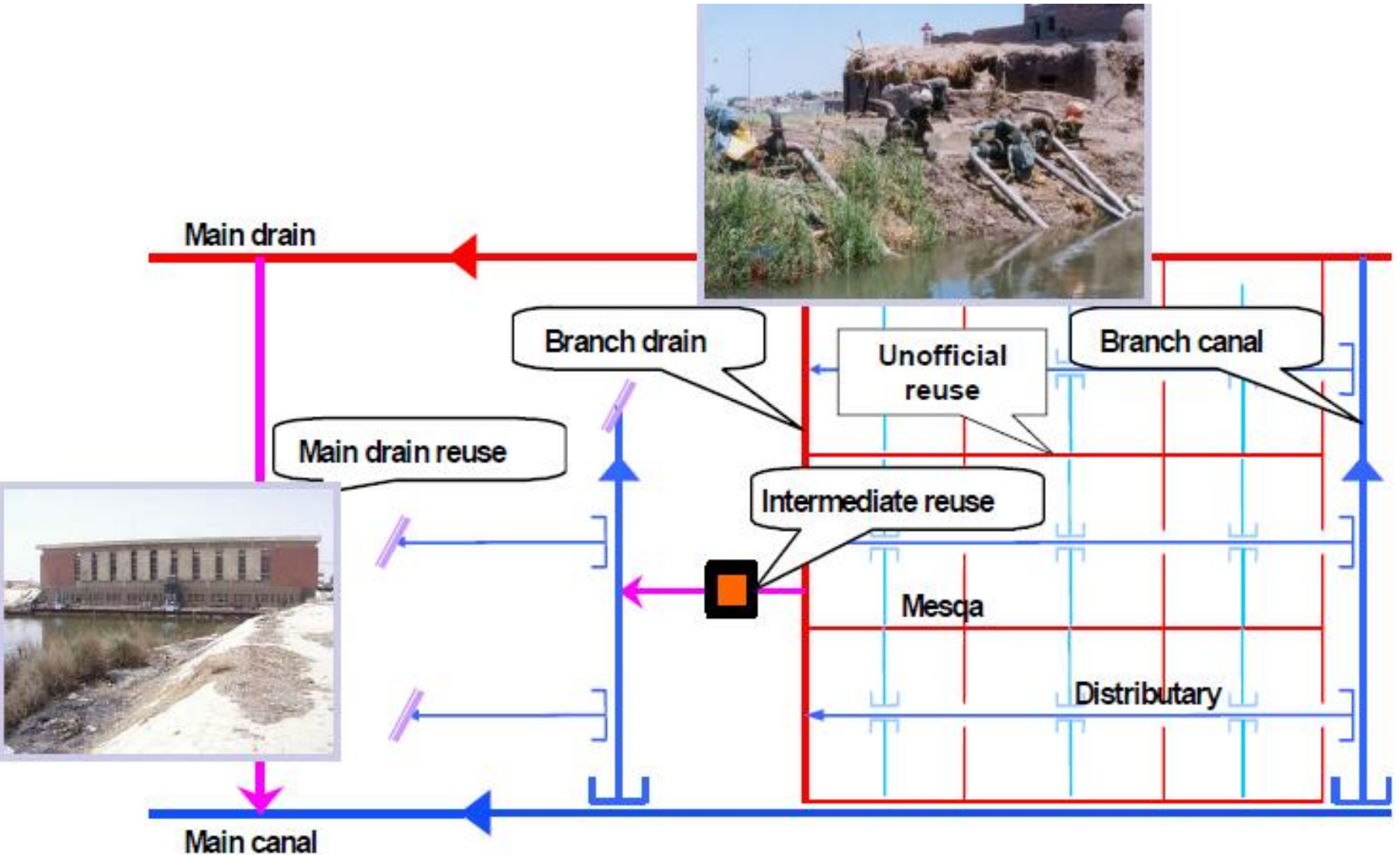
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Drainage Patterns of Egypt



Drainage Water Reuse Practice in Egypt





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Drainage Water Reuse Practice: 15 BCM year

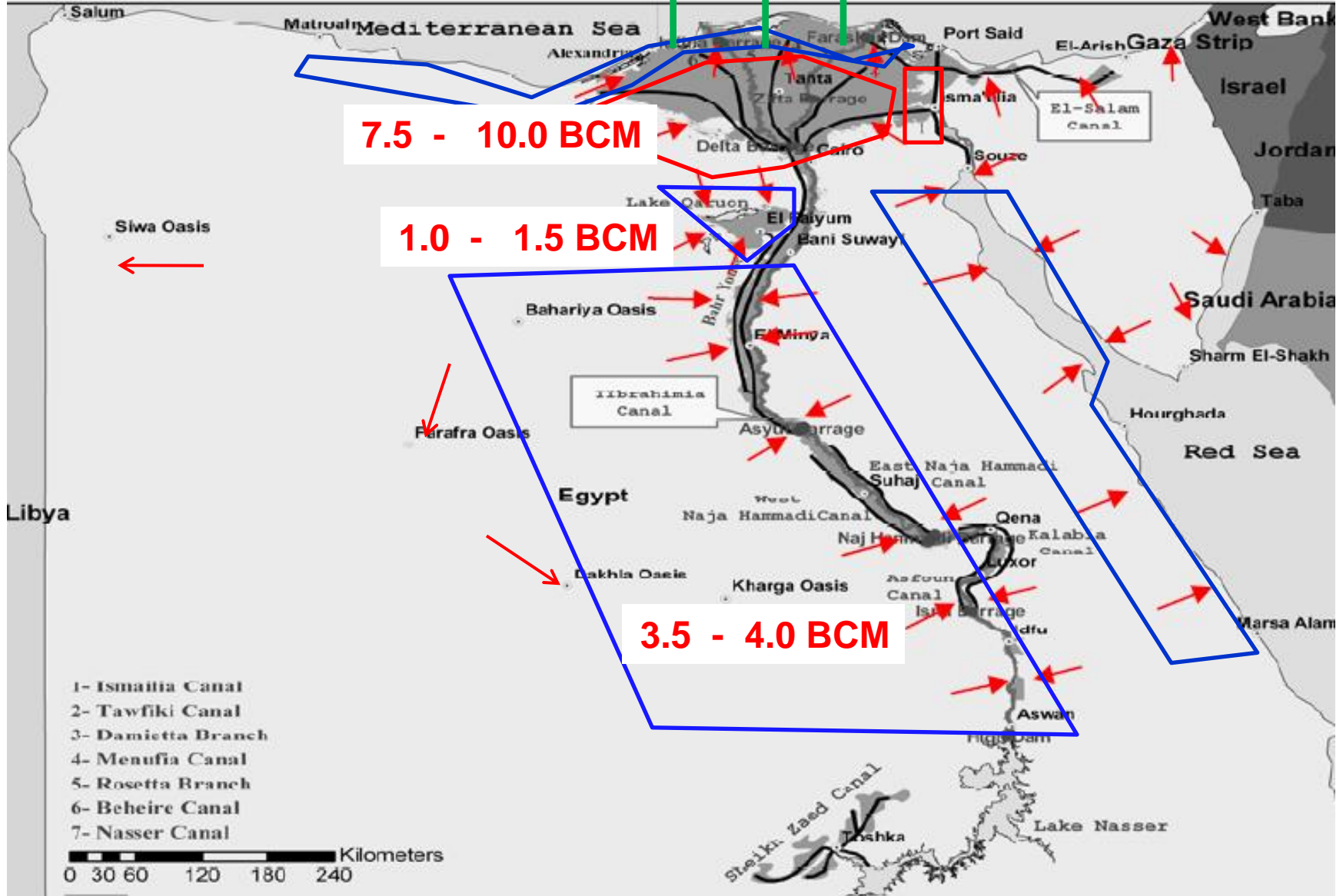
Drainage Outflow 14 BCM



7.5 - 10.0 BCM

1.0 - 1.5 BCM

3.5 - 4.0 BCM





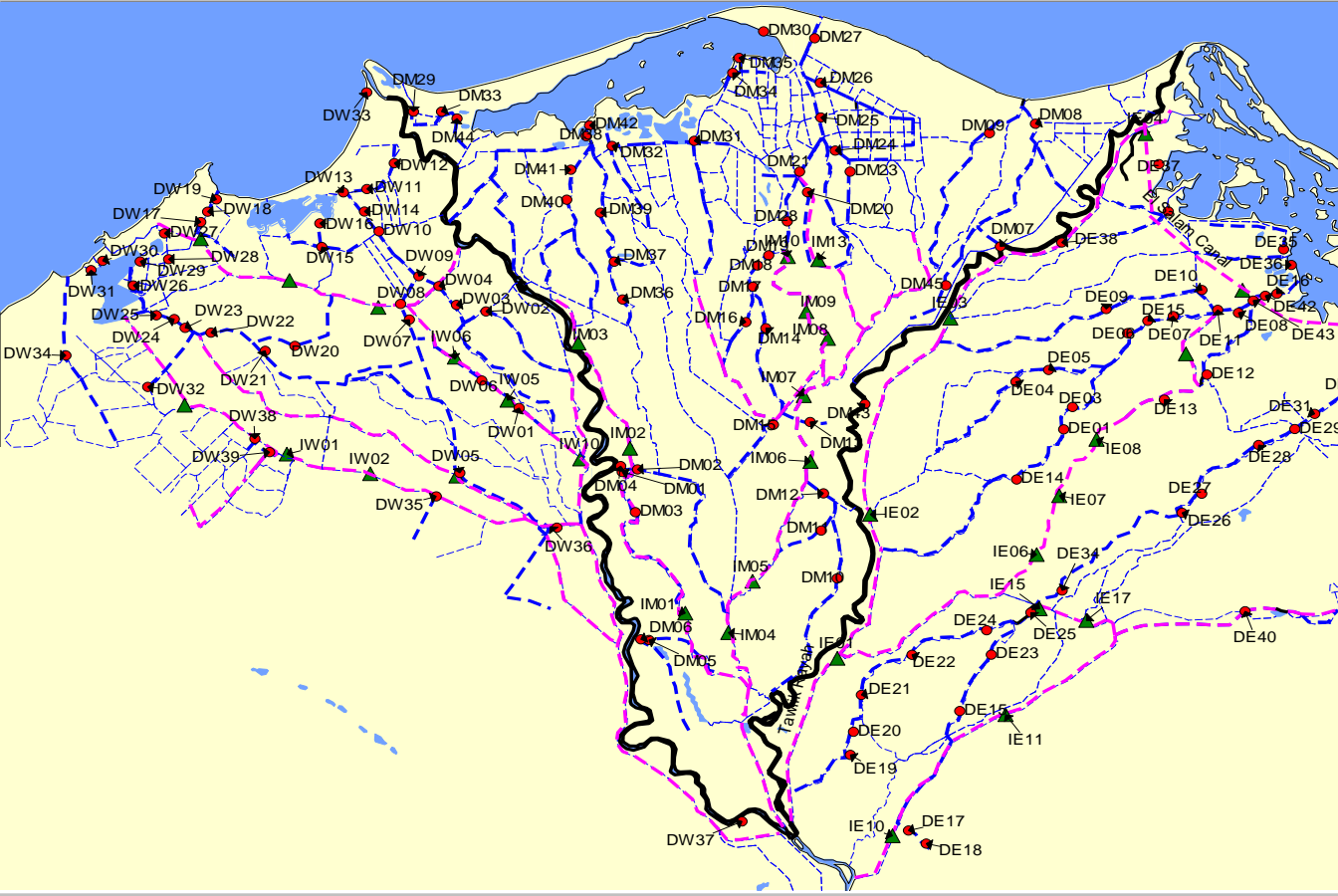
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Management of Drainage Water Reuse Regulations & Legislation (MWRI)

- **Water quality standards are specified in the implementing decree for Law 48/82 (Decree 8/1983 rev 2013)**
- **Law 12 (1984), for Irrigation and Drainage, gives the authority of licensing any drainage water reuse to the Drainage Research Institute. All guidelines for mixing drainage water with fresh water and suitable cropping pattern are provided.**

Water Quality Monitoring Network

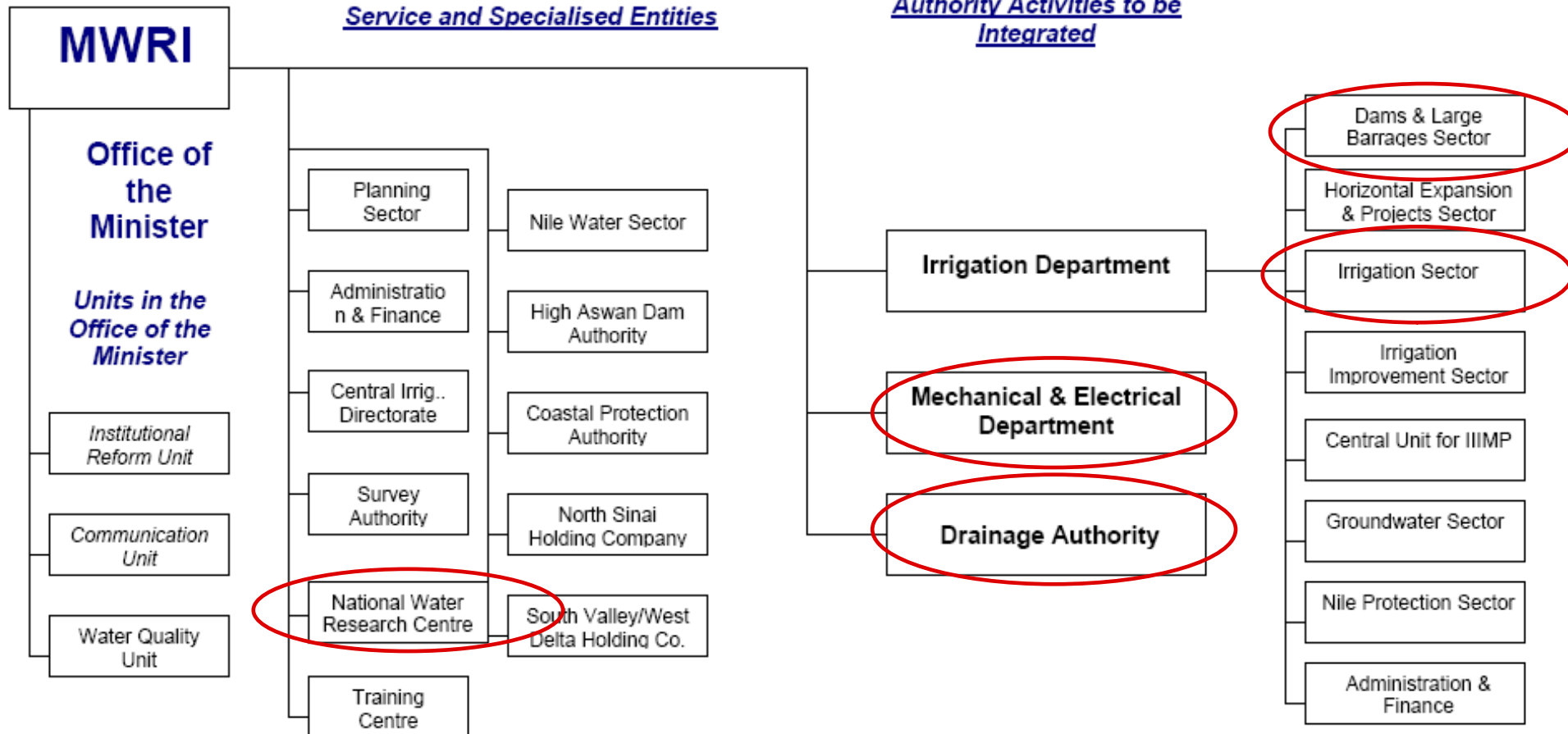


Monitoring locations in Nile Delta



Monitoring Locations in Nile River and its branches

Institutional Set Up (Key players)



Drainage Water Reuse Issues

Conflict & impact of Some Policies

- **Irrigation Improvement Program:**

includes the improvement of water delivery system and on farm-water management





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Conflict & impact of Some Policies

- **Rice Reduction :**

Upper Egypt and South of Nile Delta

- **New Reclamation Projects (Toshka Project)**

The project will withdraw 4 BCM/yr of water from Lake Nasser.

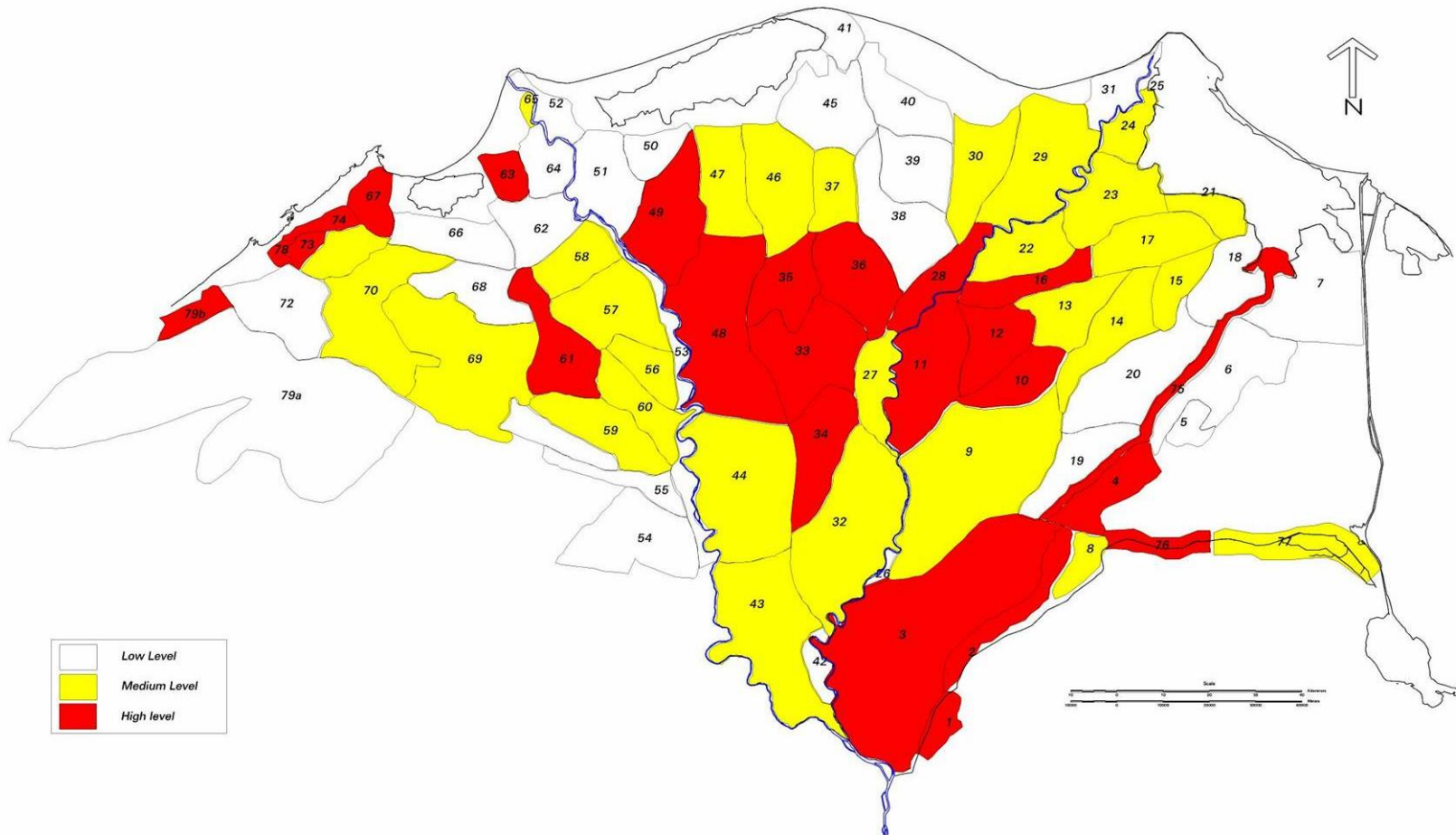
- **Policies to mitigation potential stress on water resources**

Drainage Water Reuse Issues

- **Lack of communication and coordination is revealed in:**
 - **Allocation of WWTPs & WTPs ...(MWRI, MHUUD)**
 - **Reuse is carried out at different management levels ... (Irrigation Sector, Irrigation District)**
 - **Prioritization of Water Quality Improvement...(WWTPs)**

Drainage Water Reuse Issues

■ Pollution Hazards (Shutdown and at Risk)



Pollution levels in the Nile Delta



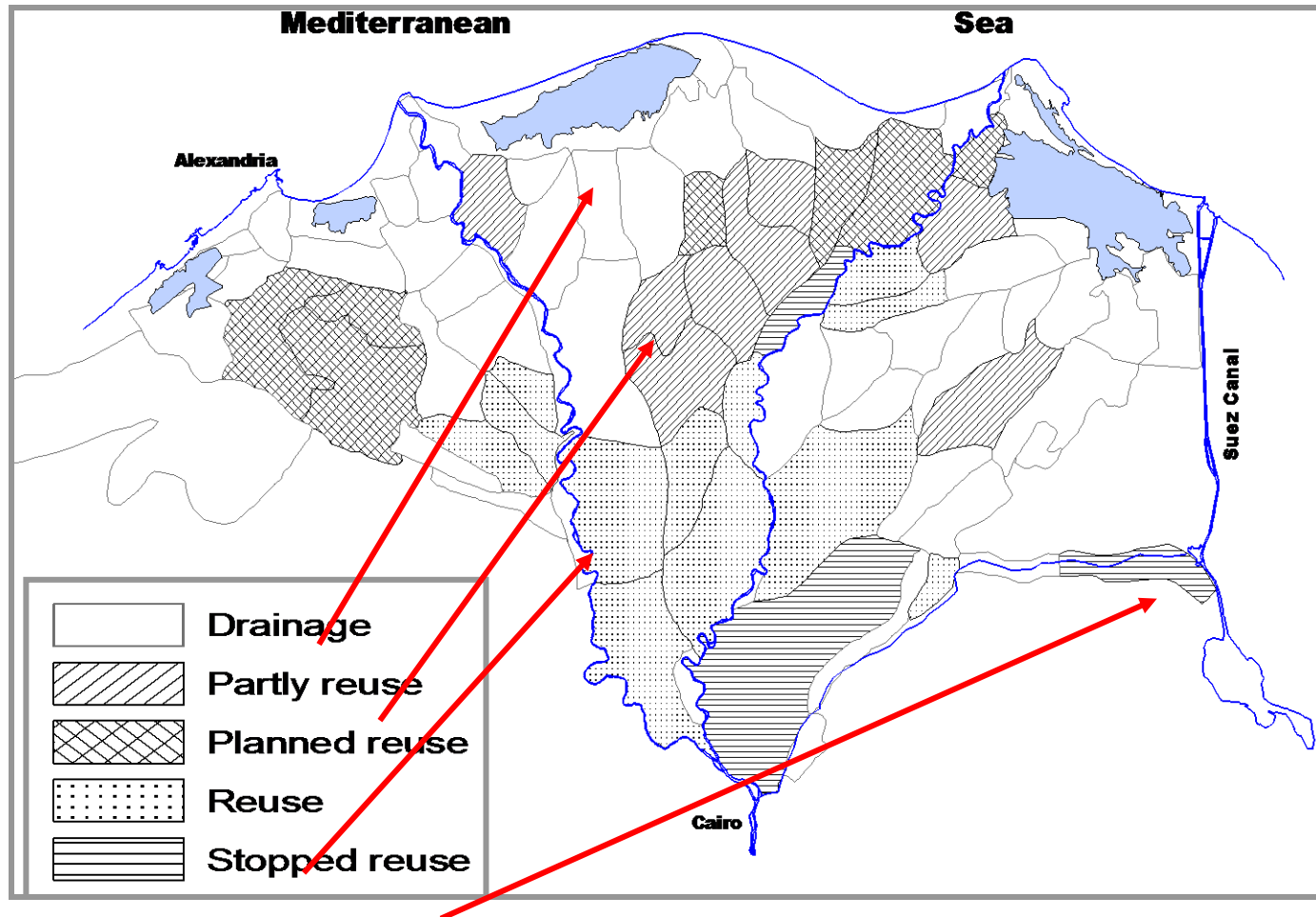
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Lack of Research Studies

- Maximum drainage water reuse ??

Considering requirements for ecological and socioeconomic activities





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Measures to Alleviate Risk of Failure

- 1. Review the Reuse Practices at Hydrological Drainage Catchment**
- 2. Define Drainage water availability for reuse Scheme (Present and Future)**
- 3. Study the impact of implemented and proposed policies on drainage water availability and quality.**

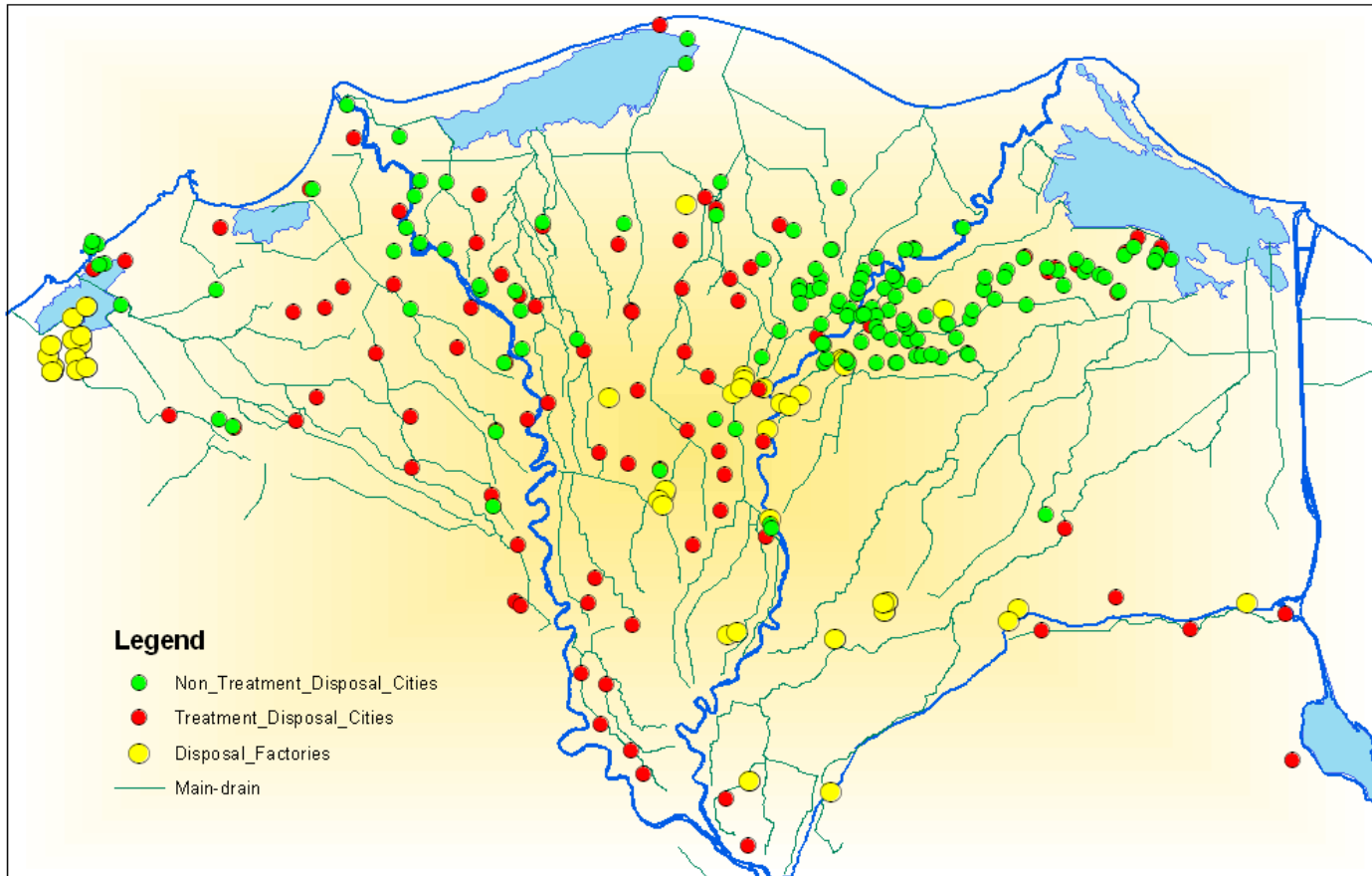


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Develop National Water Atlas (WWTPs)

There are several Ministries are involved in water resources operation and interventions. So, there is a need to clarify the objective uses and function of water ways in Egypt including irrigation and drainage.

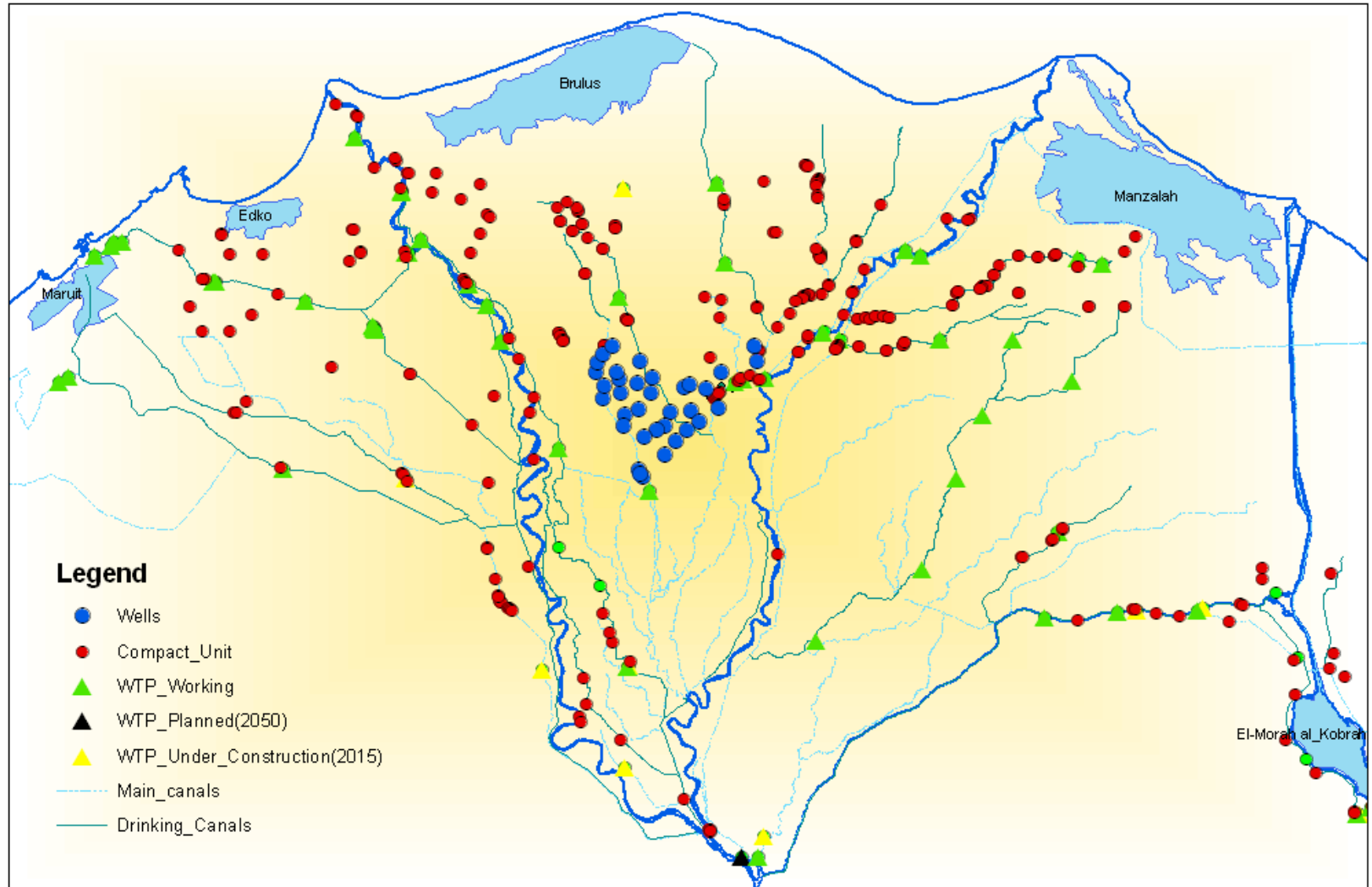




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4. Develop National Water Atlas (WTPs)



Develop National Water Atlas

Water Usage	Ministry / Authority
Drinking water	Ministry of Housing, Utilities and Urban Communities Ministry of Water Resources and Irrigation Ministry of Health and Population
Fishery	Ministry of Agriculture and Land Reclamation
Agriculture	Ministry of Water Resources and Irrigation Ministry of Agriculture and Land Reclamation
Recreations	Egyptian Environmental Affairs Agency
Livestock	Ministry of Agriculture and Land Reclamation
Industries	Ministry of Industry Ministry of Water Resources and Irrigation
Reuse of drainage water	Ministry of Water Resources and Irrigation Ministry of Agriculture and Land Reclamation
Navigation and water transport	Ministry of Transport Ministry of Water Resources and Irrigation



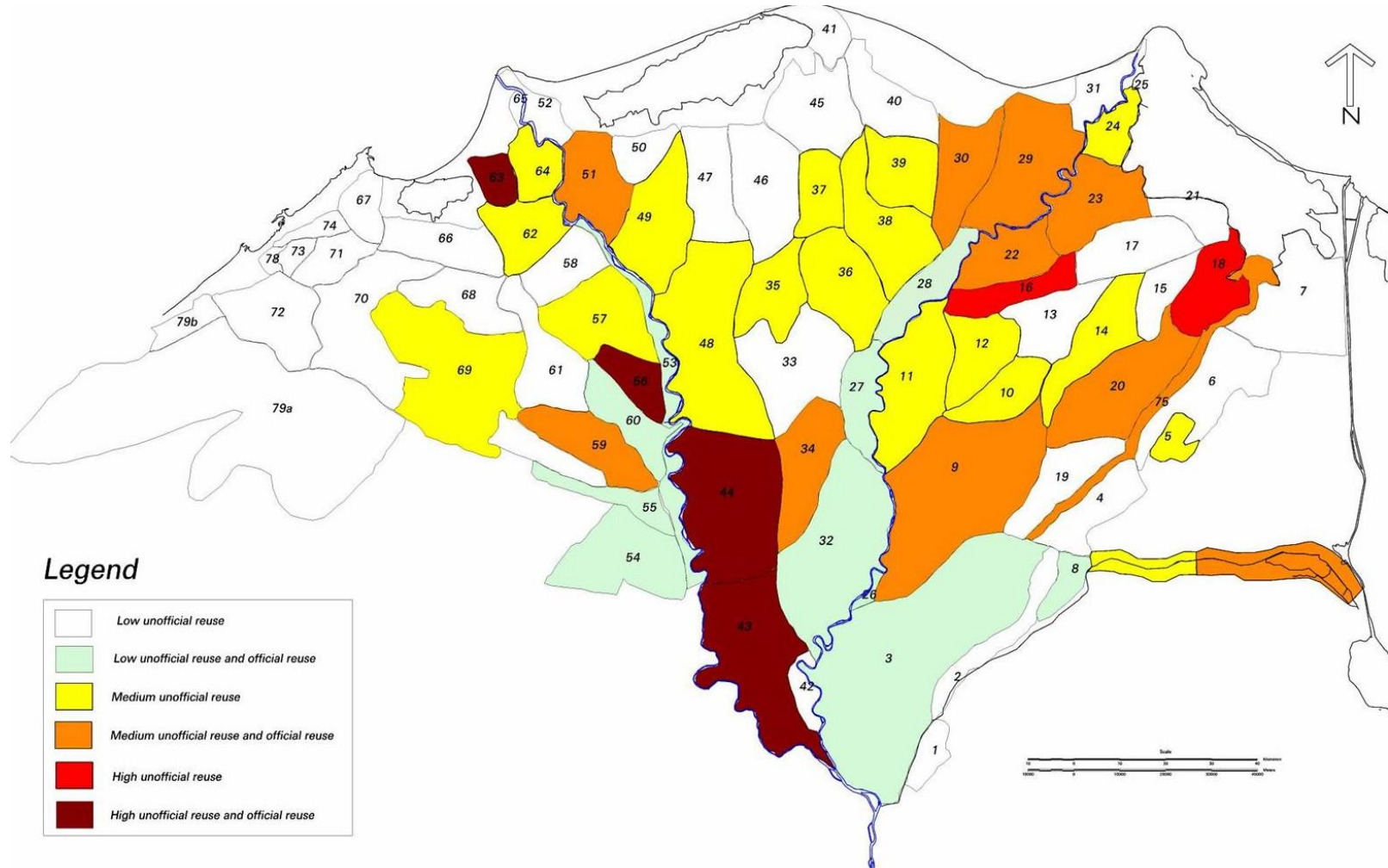
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5. Locate Drainage water reuse, Waste Influent and Water Effluents in Coordination with MWRI & MOHUUC



6. Define Priorities for Water Quality Improvement Interventions



Catchments in the Nile Delta with Official and Unofficial Reuse

7. Conduct Needed Research Studies

- **Maximum drainage water reuse**

Considering requirements for ecological, salt balance in the Nile Delta and socioeconomic activities

- **What is the impact of sea water intrusion on the quantity and quality of drainage water**
- **What is the impact on reducing the fresh water on the drainage water availability and quality**



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Thank You