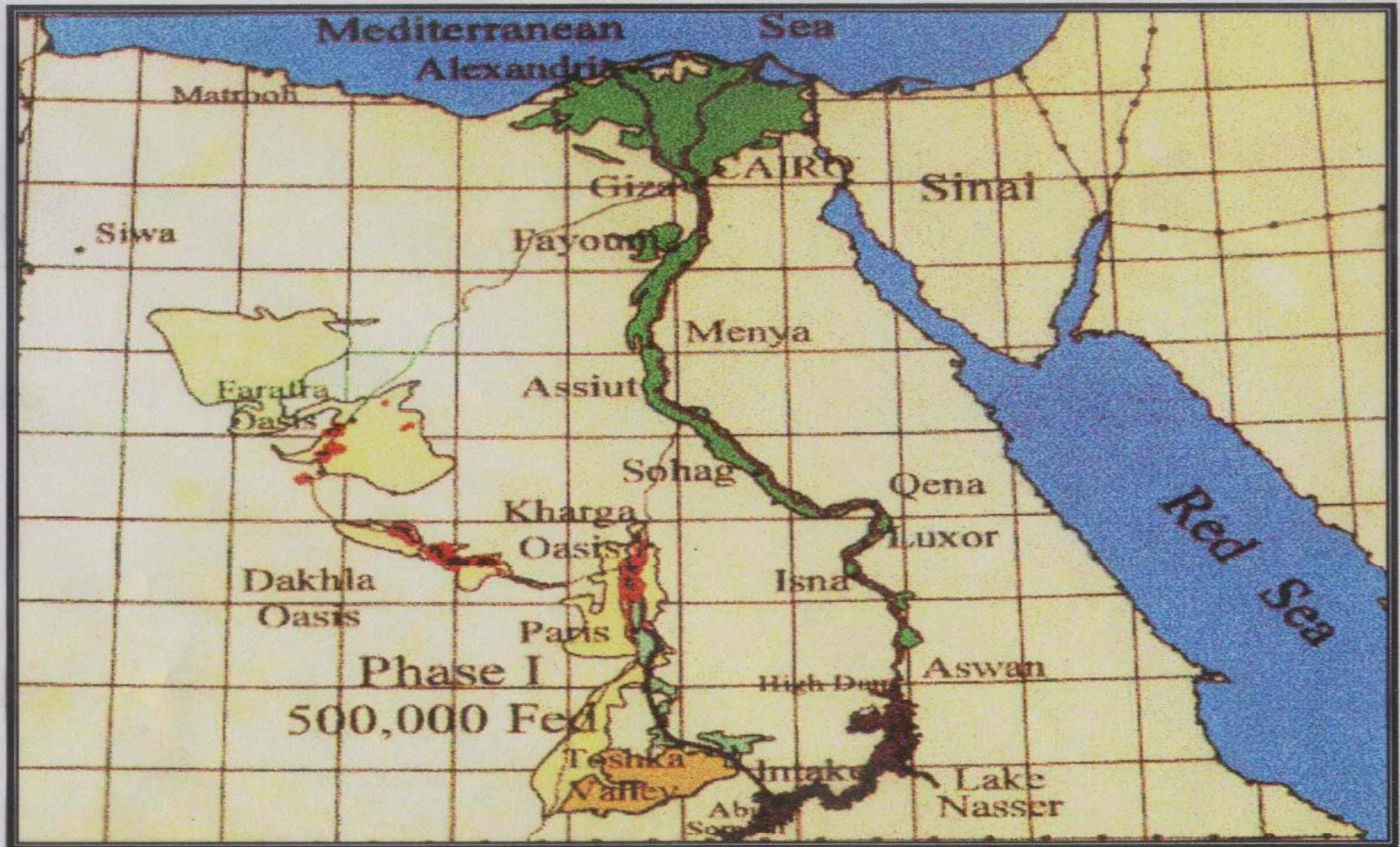


**Water Quality Deterioration
of Bahr Basandeila canal**

Dakahlia Governorate – EGYPT

Fathy El-gamal



Map of Egypt

Important Information (Governorate level)

Water Supply :

- **Population is about 5 million inhabitants**
- **Population growth rate is about 1.9 %**
- **Daily production of water supply company 1 million m³**
- **Drinking water supply is about 200 liters / capita /day**
- **Losses from water supply network is about 50 %**
- **Cost of drinking water varies according to the consumption and the uses activity. It ranged from 5cent/m³ for housing to 20 cent for industrial production.**

Important Information (Governorate level)

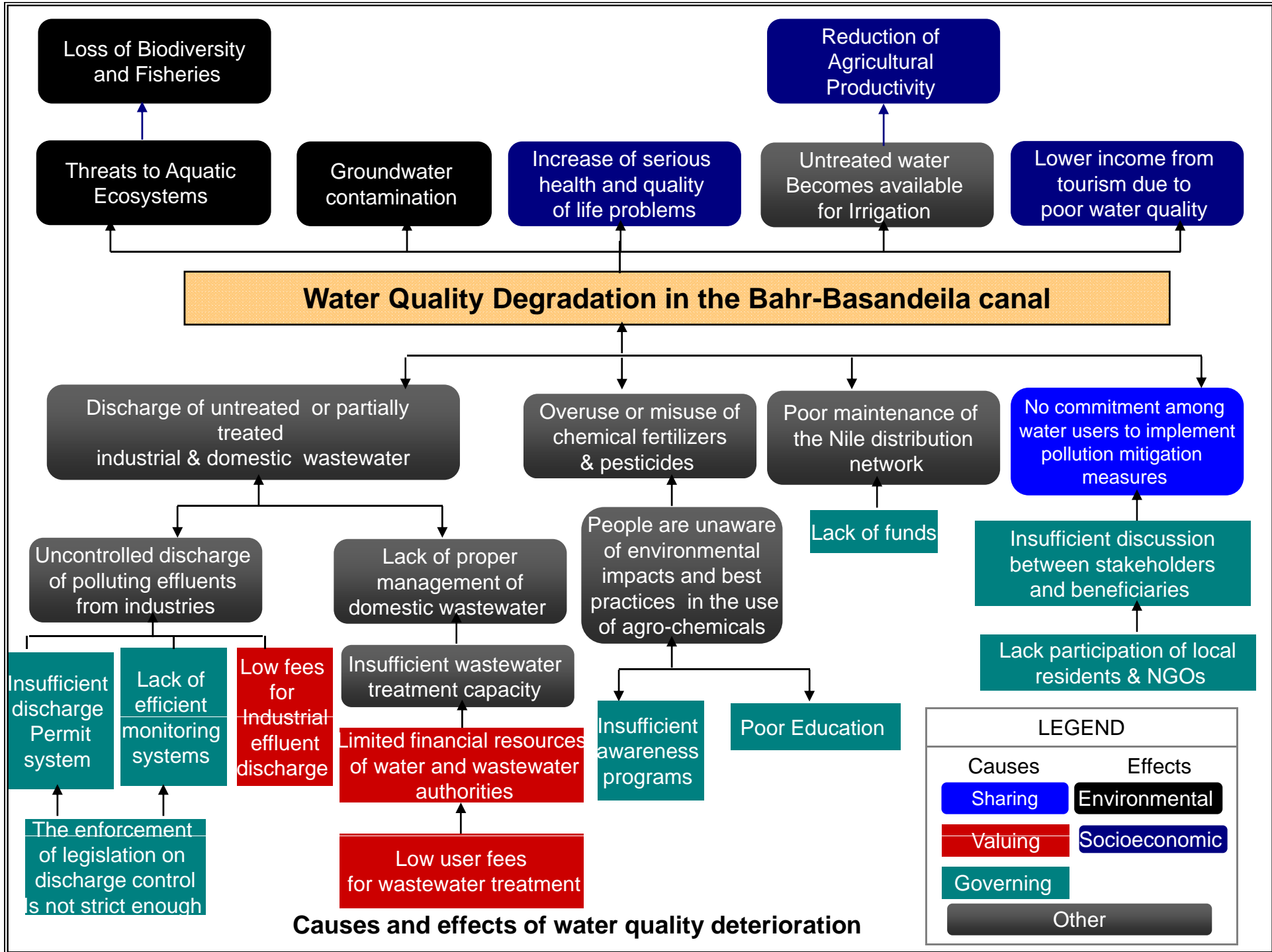
Sewerage network coverage:

- **Population served by sewerage network is about 30 %**
- **Population served by septic tanks and open drains is about 70 %**
- **Only about 25 % of Waste water is treated**
- **In the last 25 years, about \$ 900 millions is located for carrying out sewerage network projects (\$ 200 / person).**
- **The cost have been recovered completely.**

Problem:

Deterioration of Canal Water

- **Problem analysis after the stakeholder validation workshop (problem tree)**



Loss of Biodiversity and Fisheries

Reduction of Agricultural Productivity

Threats to Aquatic Ecosystems

Groundwater contamination

Increase of serious health and quality of life problems

Untreated water Becomes available for Irrigation

Lower income from tourism due to poor water quality

Water Quality Degradation in the Bahr-Basandeila canal

Discharge of untreated or partially treated industrial & domestic wastewater

Overuse or misuse of chemical fertilizers & pesticides

Poor maintenance of the Nile distribution network

No commitment among water users to implement pollution mitigation measures

Uncontrolled discharge of polluting effluents from industries

Lack of proper management of domestic wastewater

People are unaware of environmental impacts and best practices in the use of agro-chemicals

Lack of funds

Insufficient discussion between stakeholders and beneficiaries

Insufficient discharge Permit system

Lack of efficient monitoring systems

Low fees for Industrial effluent discharge

Insufficient wastewater treatment capacity

Limited financial resources of water and wastewater authorities

Insufficient awareness programs

Poor Education

Lack participation of local residents & NGOs

The enforcement of legislation on discharge control is not strict enough

Low user fees for wastewater treatment

Causes and effects of water quality deterioration

Causes of water quality degradation

Water pollution is mostly due to:

- **Discharge of Industrial and municipal effluents without proper treatment.**
- **Excessive application of chemical fertilizers and pesticides.**
- **Lack of appropriate infrastructure for waste water treatment.**
- **Limited awareness of farmers on best agriculture practices.**
- **Poor maintenance of the drinking water supply system.**

Objectives

Improvement of water quality of Bahr Basandila canal through (principal policy):

- **Control the discharge of untreated industrial effluents**
- **Control the use of chemical fertilizers and pesticides**
- **Proper maintenance of the drinking water supply system.**
- **Improvement of the quality of water services provided to drinking water supply reliability and safety and sanitation**
- **Commitment among water users to implement pollution mitigation measures and community empowerment**


Improvement of water quality of Bahr Basandila canal

- ❖ Increase awareness programs about impact of overuse of Chemicals fertilizers and pesticides And users responsibility.
- ❖ Commitment among water users to preserve the water resources.

- Increase participation of local residents and NGo and all the stakeholders in discussing the water problem.
- Increase fees for industrial effluent discharge
- Increase user fees for waste water treatment.

- ✓ Increase available fund for improving water quality activity.
- ✓ Enforce the legislation on discharge control through good monitoring system.
- ✓ Increase financial resources for waste water authorities.

LEGEND

- | | |
|----------------|---|
| Constitutional |  |
| operational |  |
| Organizational |  |

Developed Indicators:

The developed indicators are relevant to the causes and effects of the problem analysis:

Potential Indicators

To monitor the discharge of untreated waste water into the canal, the following indicators have been measured:

Coliform, Fecal, BOD, COD, DO and nitrate to measure the impact on crop quality, human health and fish production.

Potential Indicators

To monitor the discharge of agriculture drainage water into the canal, the following indicators have been measured:

- **Ze, MN, Fe, CU, Adj SAR, EC and PH to measure the impact on crop production and the deterioration of agriculture land.**

Pollution in Bahr Basandeila Canal

- ❖ Pollution in Bahr Basandeila Canal is due to Sewage wastewater.**
- ❖ Pollution from Agriculture Drainage Water in water quality is still limited.**
- ❖ Pollution from industrial effluents has no effect in water quality.**

Recommendations of the stakeholder workshops

- Increase applied research in the field of water and health .
- Work to raise awareness of water among all classes of people so as to rationalize water consumption
- Make contact with the executive bodies to reduce industrial pollution to the Nile River water
- Maintain groundwater against pollution through rationalization of the use of pesticides, fertilizers and chemicals in the agricultural field
- Cooperation with international and civil societies to reach a cup of clean water fit for the use of human, animal and agriculture.
- Doing analytical studies to study the relation between water pollution and reproductive health problems in men

Recommendations of the stakeholder workshops

A- Applying demand management approach in different sectors.

- Increasing the area in which irrigation improvement project is carried out.
- Using modern methods of irrigation instead of flood irrigation in old lands and new methods of irrigation in new lands.
- reusing of industrial wastewater within industry field.
- reusing of wastewater after processing.
- Reducing losses from drinking water network.

B- Keeping water resources from pollution.

C- Increasing awareness of all sectors of society to change and improve users' behavior and focusing on the role of woman's since the main reason of pollution is users behavior.

D- Enforce the law

E- Increasing the sharing of Urban Society, People's Assembly and religious and cultural forums in efficient water use and Keeping water from pollution.

F- Suggestion of applying simple substitutes for water purification in places in which there are no water networks.

Questionnaire

Evaluation of the applicability of economic and institutional Instruments:

The following Instruments are most preferable

- Decentralization of water management operations
- Public participation in water management
- Water pricing was the least preferable

Evaluation of the applicability of economic and institutional Instruments:

- The term water pricing is not acceptable at the private level, the use of cost recovery is more appropriate in case of Egypt
- The volumetric pricing is used only for drinking water (water supply)
- The liability system is exist but not enforced (environmental regulation and legislation)

Pollution control on a national level

- **Bahr Basandeila canal is a representative for most of our irrigation network.**
- **Pollution is a national problem**
- **Pollution is not always a result of an increased input of matter, but can also result from a decrease in the quantity of diluting water.**

National water resources plan 2017

Sources of pollution:

Domestic sources (waste water)

- Construction of water supply networks without parallel construction of new sewage systems or rehabilitation of the existing one.

Agricultural sources (salts, agrochemical residues from fertilizers, pesticides, herbicides)

Industrial sources (waste water without treatment)

National water resources plan 2017

- Finding solutions (water quality policy)

The pollution control activities are:

Prevention, reduction, treatment and impact modification.

Finding a compromise between the interests of socio-economic activities that cause pollution and the need for a good water quality to protect human health and the environment.

National water resources plan 2017

Policy objectives for the strategy of water quality are:

- Improvement of water related public health conditions
- Sustainable use of ground water resources
- Meet the water quality requirements of the various functions of the water ways.

National water resources plan 2017

To achieve these goals the following priorities and principles were applied:

- Based on precautionary principle, measure should be aimed at preventing emissions, or treatment or finally controlled emission can be considered.
- Every polluter is responsible for his emissions (polluter pay principle)

National water resources plan 2017

- Pollution problem should not be passed from one region to another downstream in the water system
- Measures that do not rely on institutional or legal changes are preferred in the short term.

Summary of measures on Municipal and Industrial water

Demand management

- Install/rehabilitate metering system and apply progressive tariff structure
- Initiate public awareness campaign to reduce wasteful use of water
- Promote the application of water saving technologies in industry through incentives

Reduction of losses

- Reduce leakage losses through leak detection and repair based on priorities for the most urgent rehabilitation work
- Reduce other losses through repair/installation of metering system

Reuse of treated wastewater

- Carry out feasibility studies, including environmental impact assessment for reuse of treated wastewater in the New Industrial Cities and the Canal Cities

Thanks