

Processus de Barcelone : Union pour la Méditerranée

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Projets proposés par l'Égypte

First Theme: De-Pollution of the Mediterranean

Project 1: Monitoring of Water Quality in the Northern Lakes and Nile River Branches through the application of Remote Sensing Technologies.

Background:

Water turbidity and harmful algal blooms are two important parameters in defining water quality in the Mediterranean Sea. Existing observations suggest a dominant effect of freshwater discharge and wind on those parameters, yet it still remains a challenge to establish a significant relationship due to the typical high variability and short life time of those parameters in the Mediterranean region. It is anticipated that remote sensing techniques can help in monitoring water quality in the Northern lakes and the Nile River delta given that several satellite observation platforms are nowadays available and new sensors are being launched to increase our capacity in water quality assessment and monitoring. This will help in the short and long run to improve the Mediterranean Sea water quality in a cost effective way.

Problem Statement:

The impact of humans on the water cycle and terrestrial water and ecosystems is of increasing importance, especially in relation to water quality. In this sense, degrading water quality contributes heavily to water insecurity globally. This becomes clear where water is drained into the Mediterranean Sea as the quality of this water degrades over time. Therefore, the quality of this drained has to be monitored in order to identify the locations where its quality degrades and implement plans to improve it (i.e. hot spots).

Objectives:

1. Review existing water quality monitoring programs for the Northern lakes and Nile River delta;
2. Review and apply remote sensing techniques to monitor water quality to assist in the reduction of water pollution.
3. Monitor the quality of the drained water to the Mediterranean Sea in order to improve the Mediterranean Sea water quality.
4. Recommend water quality indicators and classification schemes.

Expected Outputs:

1. Maps showing indicative quality of the water in the Northern lakes and the Nile River delta.
2. Detailed mapping of water quality parameters where quality problems exist.
3. Recommendations regarding water quality improvements.

Benefits to the Euro-Med Countries:

The project will help building a local-scale mapping of indicative quality of the water in the Northern lakes and the Nile River delta. This will help in improving the quality of the sea water at local and regional levels, and this can be generalized to other locations along the shoreline of the Mediterranean Sea.

Project 2: Improve and Enhance the Efficiency and Performance of the Nile Delta Northern Pump Stations.

Background:

Existing observations of water quality parameters in the Mediterranean Sea suggest a dominant effect of freshwater discharge and wind on those parameters, yet it still remains a challenge to establish a significant relation-ship due to the typical high variability and short life time of those parameters in the Mediterranean region. It is anticipated that improving and enhancing the efficiency of the Nile delta Northern pump Stations will help in the short \ long run to improve the Mediterranean Sea water quality.

Problem Statement:

The impact of humans on the water cycle and terrestrial water and ecosystems is of increasing importance, especially in relation to water quality. In this sense, degrading water quality contributes heavily to water insecurity globally. This becomes clear where water is drained into the Mediterranean Sea as the quality of this water degrades with time. Therefore, the quality of this drained has to improved in every possible way.

Objectives:

1. Raise and enhance the efficiency of the existing Northern Nile delta pumping station to be capable of pumping water with low or improved quality to the Mediterranean Sea to prevent flooding in wide areas of the Nile delta in case of one or more of these pumping stations fail, since they were constructed approximately seventy years ago.
2. Construct new treatment plants that will be linked to the pumping stations draining polluted water to the Mediterranean Sea and Northern Lakes.
3. Enhance the social circumstances of people living and cultivating near the pumping stations who use polluted water that eventually drained to the Mediterranean Sea.

Expected Outputs:

1. Improved quality of the water that is drained in to the Mediterranean Sea from the Northern Pump Stations.
2. Better life and health standards for people living and cultivating near the pumping stations

Benefits to the Euro Med Countries:

The project will help to improve water quality in the Mediterranean Sea.

Project 3: Solar Energy Utilization for Energy Saving and Environmental protection

Background:

World demand for energy is projected to more than double by 2050 and to more than triple by the end of the century. Incremental improvements in existing energy networks will not be adequate to supply this demand in a sustainable way. Finding sufficient supplies of clean energy for the future is one of society's most daunting challenges. Sunlight provides by far the largest of all carbon-neutral energy sources. More energy from sunlight strikes the Earth in one hour than all the energy consumed on the planet in a year. This resource has to be exploited to the possible maximum extent in irrigation and drainage structures such as pumping stations as it provides a cheap and sustainable source of energy.

Problem Statement:

With the increase of the oil and energy prices, it is plausible to look for alternative energy sources. Solar energy seems to be the right answer for this problem as the sun provides a source of clean and abundant energy. Yet, in 2001, solar electricity provided less than 0.1% of the world's electricity, and solar fuel from modern (sustainable) biomass provided less than 1.5% of the world's energy. The huge gap between our present use of solar energy and its enormous undeveloped potential defines a grand challenge in energy use. Sunlight is a compelling solution to our need for clean, abundant sources of energy in the future. It is readily available, secure from geopolitical tension, and poses no threat to our environment through pollution or to our climate through greenhouse gases.

Solar energy conversion systems fall into three categories according to their primary energy product: solar electricity, solar fuels, and solar thermal systems. Each of the three generic approaches to exploiting the solar resource has untapped capability well beyond its present usage. This project will exploit these options to find the most viable solutions that can be used to in the operation of the Irrigation and drainage Pumping Stations, Pumping of Water from underground Reservoirs, and On-farm Irrigation.

Objectives:

1. Utilization of the national resources through the usage of the solar system energy in the following areas:
 - Operation of Irrigation and drainage Pumping Stations.
 - Pumping of Water from underground Reservoirs.
 - On-farm Irrigation.
2. Enhancement of the environment through reduction of the GHGs emission .

Expected Outputs:

1. Irrigation and drainage systems operating with solar energy
2. Water wells operating with solar energy

Benefits to the Euro Med Countries:

The use of solar energy, if generalized, will lead to a better environment to the all countries in the region.

Second Theme: Climate Change in the Mediterranean

Project 1: Cooperation on Climate Change Impact and Adaptation Studies in the Water Resources Sector

Background

During the past few decades, it has become apparent that human activities such as fossil fuel burning and land-use change (e.g. deforestation) have considerably increased the atmospheric concentrations of greenhouse gases (GHGs). As a result, changes in climate have started and are expected to continue for centuries/millennia after GHGs' concentrations stabilize (if at all possible). It is expected that climate change will cause a chain of impacts at the global, regional, and local levels affecting all economic sectors in one way or another. The expected change in climate is likely to affect natural ecosystems, including forests, wetlands, coastal areas, water resources systems, food supplies, human health, and socio-economic systems.

Climate change is likely to increase the stress on currently stressed resources, especially in the developing world. Studies have shown that most systems are sensitive to both the magnitude and the rate of climate change. However, the vulnerability of a system to the expected change depends on economic strength and existing infrastructure, which makes developing countries, such as Egypt and other southern Mediterranean countries, generally more vulnerable and less able to adapt. The uncertainty of the change and its interaction with non-climatic changes in non-linear systems make it difficult for policy makers to anticipate the changes and take steps to mitigate, adapt, or take advantage of it. Nevertheless, current knowledge of climate change should never be ignored in the formulation of future policies regarding, for example, water resources management, food production, or environmental protection.

Problem Statement

Water resources are amongst the most vulnerable sectors to climate variability and change in Egypt and other southern Mediterranean countries. Previous assessments of climate change impacts on water resources, especially for the Nile Basin, are characterized by a high level of uncertainty that made it difficult to devise possible adaptation options and build the required adaptive capacity within the water management system.

Objectives

This project aims to assess the impacts of climate change on water resources and develop adaptation strategies within the water management policies to address climate change issues.

Specific objectives include:

- To conduct a rapid preliminary assessment of climate change impacts on water resources
- To assist regional experts undertake scientific studies to assess the impacts of climate variability and change on the availability of water resources
- To establish a regional network among the EURO-MED on adaptation to climate change in the water sector, facilitating improved communication and increased commitment from various ministries, local governments, research institutions, partners, the business community and NGOs
- To develop a regional agenda and action plan for climate change adaptation in the water resources sector

Expected Outputs

By the end of the project, the following outputs should be available:

- Projected changes in the water resources system in response to climate change
- Identified adaptation strategies and policies in the water sector that influence the planning, operation and management of water resources infrastructure
- A network of professionals from the water sector in the EURO-MED countries that facilitates exchange of ideas, experience, best practices and lessons learned within this field

Benefits to the Euro-Med Region

Implementation of this project can improve climate change adaptation capacity and mechanisms for knowledge exchange within the region.

Project 2: Climate Change Impact and Adaptation Studies for the Coastal Line and Deltas

Background

Global-mean sea-level rise occurred through the 20th Century, and continued rise is one of the more certain impacts of global warming. This is resulting in a range of impacts including increased flood risk and submergence, salinisation of surface and ground waters, and morphological change, such as erosion and wetland loss. In addition, deltas are often low lying lands containing agricultural lands and large urban centers that are at risk of inundation due to sea level rise. The potential human and ecosystem impacts in the 21st Century are significant but uncertain. Actual impacts will depend on several local factors in addition to the amount of sea level rise due to climate change, including a number of factors which are human-controlled such as coastal land use and management approaches and other natural factors such as subsidence.

Importantly, there is a strong '*commitment to sea-level rise*' due to the long thermal lag of the ocean system and hence the response of sea-level rise to mitigation is slower than for other climate factors. Therefore, the main benefits of mitigation of climate change in terms of sea-level rise occur beyond the 21st Century. This means that the best response to sea-level rise and climate change in the coastal zone is an appropriate mixture of mitigation and adaptation. Hence, joint evaluation of mitigation and adaptation is required in the coastal zone as these policies are intertwined. Such assessments must continue beyond 2100 to provide the full implications of the different policy choices. Further, policymakers should note that the results of any assessment of sea-level rise and climate change depend on the scale of assessment and the detailed methods utilized. For instance, choices on adaptation are sensitive to spatial scale. Hence, there is a critical need to match policy questions and formulation to the appropriate level of assessment.

Problem Statement

Despite the concerns about sea-level rise, most countries, and especially developing countries, appear to be ignoring changes in sea level in coastal planning at the present time. There is a need to develop the adaptive capacity of vulnerable coastal areas such as low lying deltas and small island states and mainstream these into development policies.

Objectives

This project aims to assess the impacts of climate change induced sea level rise on coastal resources and develop adaptation/mitigation strategies within the development policies to address climate change issues. Specific objectives include:

- Study and quantify the effect of the climate change on the coastal line and deltas in the Mediterranean area particularly in the southern countries
- Assess the risks and impacts arising from climate change on natural hazards and on communities (e.g. migration, loss of life and property)
- Develop adaptation/mitigation strategies
- Inform the planning process

Expected Outputs

By the end of the project, the following outputs should be available:

- Regional and country-scale mapping of coastal resources evolution and change in response to climate change induced sea level rise
- Identified adaptation and mitigation strategies for coastal resources management including community-based measures and costs
- A network of professionals in coastal zone management in the EURO-MED countries that facilitates exchange of ideas, experience, best practices and lessons learned within this field

Benefits to the Euro-Med Region

Implementation of this project can improve adaptive capacity to climate change regarding coastal resources and mechanisms for knowledge exchange within the region.

Third Theme: Capacity building for the Mediterranean countries

Project 1: Capacity Building in Areas of IWRM, Water Quality, Information Systems, Climate Change and Monitoring.

Background:

Delivering better services is the key to improving the quality of life for many citizens. Governments set out the main challenges to local authorities, their members and staff. It significantly draws on the need to build management capacity by developing a range of skills. This is essential if local authorities are to meet the challenges of increased responsibility, greater freedom and new powers. Governments are committed to supporting this improvement and modernization process and recognize its importance to reach their aim of high quality public services, coexisting with strong communities.

Problem Statement:

The Euro-Med countries have to deal with the following three gaps in order to develop in a sustainable and consistent manner:

- 1- Lack of capacity to manage water in an integrated manner.
Most of the Southern countries are burdened by weak human and institutional capacity to manage water resources in an integrated manner. This situation applies not only to the management of international waters, but also to the management of national waters, at the level of a river basin or at the level of a country. That is, water management within each country is still fragmented between sectors, and there is little integration among various sectors of water use, between water quantity and quality, and between surface and groundwater.
- 2- Uneven distribution of capacity within the basin.
A central issue is that the water sector in the region is characterized by widely diverse institutional capacities in the countries. The availability of water professionals, for instance, varies from 100 in one country to several times that number in another. Senior managers, trainers, and researchers are even fewer. There is a great need for some of the countries in the Southern countries to develop a strong cadre of trained professionals, whilst other countries that already have such a group can help them by providing training programs and transferring knowledge and experience.
- 3- Little interaction among water professionals in the basin.
By its very nature, management of transboundary waters is a complex matter. Political, economic, social, and cultural differences among the countries pose a major challenge to this as well. The absence of opportunities for exchange of experience among the water professionals in particular, and among people at large, has been a constraint to building a water organization engaged in professional interaction and joint problem-solving.
The project aims to address the above gaps and variation among countries. The program is inclusive, taking into account initiatives of the countries themselves, and the assistance activities of all donors and institutions that will be involved in capacity building.

Objectives:

- 1- Capacity building and sharing of knowledge on integrated water resources management, water reuse and desalination technologies.
- 2- Organizing regional conferences and workshops to assist in the direction of IWRM and climate change adaptation in the management cycle of the EURO-MED countries.

- 3- Enhance the awareness of the pollution process through applying special programs between the Mediterranean countries;
- 4- Establishing training modules to support an improvement of the information management system;
- 5- Assess regional analytical capabilities in different fields related to water resources;
- 6- Provide technical support for strengthening the regional laboratories' efficiency and staff capacity to undertake local measurements related to the climate change aspect;
- 7- Assess the quality control procedures (AQC) and to make recommendations on improvements within the region and to propose a EURO-MED module for quality control aspects in the water sector;
- 8- Improve capacities and capabilities in regional laboratories;
- 9- Implement a more effective monitoring system to respond to pollution incidents.

Expected Outputs:

- 1- Capacity strengthening in the selected subject areas within the region.
- 2- Building or strengthening centers with the capacity to develop and deliver training programs in the selected subject areas.
- 3- Expanding the frequency and scope of region interchange among water professionals involved in capacity building activities.

Benefits to the Euro Med Countries:

The project provides support for region-wide capacity building through a network of training, education, and research institutions which will be established in the region, while at the same time creates a pool of trained manpower.

Project 2: Formulate a Permanent Joint Research Committee between the Euro-Med countries

Background:

Research is a key element in the development of nations. It clearly advances the knowledge on a wide variety of matters of our world and the universe. Research benefits are maximized when it is undertaken collectively between interested parties. The aim of this project is to bring together the research experience of the Euro-Med countries into a joint committee that guides the research in these countries.

Problem Statement:

The gap in research activities between the southern and the northern countries in the Mediterranean is massive. Closing this gap needs efforts from both sides. Northern countries need to launch and support academic programs provided at MSc. and PhD. levels and training projects. Southern countries have to find appropriate candidates that will benefit from participation in this research program.

Objectives:

- 1- Establish and prioritize research directions with high potential for the Euro-Med countries.
- 2- Support the research activities in the south of the Mediterranean Sea in order to cope with the research in the Northern developed countries.
- 3- Draw up research guidelines and monitor Euro-Med activities from a scientific perspective.

Expected Outputs:

- 1- Work plan for research activities in the Euro-Med countries
- 2- Cooperation research programs between the Northern and southern countries in the Mediterranean.

Benefits to the Euro Med Countries:

This project will help to maximize the research benefits in the Euro-Med countries and enable knowledge and experience transfer.

Fourth Theme: Integrated Water Resources Management Programs for the protection Of Echo System in the Southern Countries

Project 1: Irrigation Improvement and Drainage Rehabilitation Projects

Background

Water is an increasingly scarce resource in the Mediterranean region, where most of the water used is still for agricultural purposes. Demand for water is far outstripping supply and groundwater extraction is exceeding sustainable rates of withdrawal. This has disastrous consequences for water quality and the environment. The availability of renewable freshwater resources in many countries of the region, especially south of the Mediterranean is under 1000 m³/year per capita, and is expected to fall further due to growing demand and dwindling supplies.

Therefore, a major challenge facing many countries in the Mediterranean basin is to close the rapidly increasing gap between the limited water resources and the escalating demands by different users. The main objective of the water policy in many of these countries is to ensure the sustainable exploitation of the water resources system in support of production of economic goods and services that are required to meet national and regional development objectives.

Problem Statement

Most of the water is used for agricultural purposes, whether rain-fed or irrigated. Surface irrigation is the widely used method in the region and it is characterized by low water use efficiency and low productivity due to water logging problems in the upstream reaches and water stress in the downstream reaches of canal systems (whether fed by rivers or groundwater wells). This also causes equity problems amongst water users along the canal. There is a need to modernize irrigation methods to improve water use efficiency, equity, and crop productivity. This may lead to saving water that could be used for other purposes, e.g. agricultural expansion which could help reduce the risk of soil erosion and desertification.

Connected to irrigation improvement, is the need to remove excess irrigation water from fields to reduce water logging problems by collecting this water through field drains (surface and/or subsurface). This also helps reducing salinity problems leading to improved crop productivity. Collected drainage water can also be reused to irrigate some salt tolerant crops or trees to help reduce desertification.

Objectives

This project aims to improve water use efficiency, equity, and productivity of water distributions systems within the region. Specific objectives include:

- Modernize and/or improve irrigation methods
- Improve / provide drainage
- Increase agricultural productivity and food security
- Maximize the use of available water resources
- Reduce the risk of soil erosion and desertification

Expected Outputs

By the end of the project, the following outputs should be available:

- Higher water use efficiency in project areas
- Higher agricultural productivity
- Reduced desertification risk
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Benefits to the Euro-Med Region

Implementation of this project can improve food security in the region.

Project 2: Institutional Reform

Background

Water is the essence of development in all sectors; agriculture, industry, mining, hydropower, navigation, environment, etc. Therefore, several governmental and non-governmental institutions play different, and sometimes conflicting, roles in the management of water resources and uses. While there is usually a ministry responsible for water resource planning and management, other stakeholders have their own interests and responsibilities in the management. Within that central water management body, several departments are assigned different, but sometimes overlapping, mandates ranging from resource exploration, planning, monitoring, operation and maintenance to legislation and collaboration with other stakeholders.

Problem Statement

Central government institutions tend to inflate and expand over time leading to inefficient use of available human and financial resources used to perform the above mentioned mandates. New units are created over time to perform specific tasks and then they get annexed to some departments after their task is done overloading the organizational structure. In addition, there can be multiplicity of organizational levels, i.e. a large number of levels, and thus a decision made at the top level or a problem occurring at the implantation level takes a long time to be communicated to the other end of the organizational chain. There is a general lack of organizational manuals specifying the authorities and responsibilities of each department.

The issues become more complex in the case of transboundary resources such as shared lakes, river basins, and groundwater aquifers.

Objectives

This project aims to improve the institutional framework of water resource management. Specific objectives include:

- Improve organizational structure of water management institutions
- Improve communication within water management intuitions and with other stakeholders
- Maximize the use of available financial and human resources

Expected Outputs

By the end of the project, the following outputs should be available:

- Better organizations for water management
- Established / improved communication protocols
- Reduced resource waste

Benefits to the Euro-Med Region

Implementation of this project can provide a better paradigm for cooperation amongst member countries