

**Feasibility Study on the
Development of a
Regional Water
Observation Mechanism
in the Mediterranean
Region**

Cyprus Diagnostic Study

June 2007

MEDA Water



Funded by European Union

Prepared By



CONQUEST
BUSINESS
ADVISORS

Disclaimer: *"This report has been produced with the assistance of the European Union. The contents of this document is the sole responsibility of the CBA company mandated by the EMWIS Technical Unit in the framework of EMWIS Phase II contract ref ME8/AIDCO/2003/004763/069442 and can in no way be taken to reflect the views of the European Union."*

Table of Contents

LIST OF COMMONLY USED ACRONYMS	4
1. INTRODUCTION	6
2. UPDATE OF THE JOHANNESBURG 2002 REPORT	8
2.1 CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC POLICIES - TRADE.....	8
2.2 CHAPTER 17: PROTECTION OF THE OCEANS, ALL KINDS OF SEAS, INCLUDING ENCLOSED AND SEMI-ENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE AND DEVELOPMENT OF THEIR LIVING RESOURCES.	8
2.3 CHAPTER 18: PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES.	12
2.4 CHAPTER 40: INFORMATION FOR DECISION-MAKING	16
3. COUNTRY REPORT SUMMARY	18
3.1 INTRODUCTION	18
3.2 ENVIS.....	19
3.3 CYMOS	19
3.3 AVAILABLE WATER INFORMATION TYPES	20
3.4 DIFFICULTIES LINKED TO WATER INFORMATION ACCESS	22
3.5 DIFFICULTIES FOR WATER INFORMATION DISSEMINATION AND EXPLOITATION	22
4. SYNTHESIS OF OPINION AND EXPECTATIONS OF STAKEHOLDERS	24
4.1 ANALYSIS OF DATA PRODUCERS/ MANAGEMENT RESPONSES.....	25
4.2 ANALYSIS OF DATA USERS RESPONSES	26

List of Commonly Used Acronyms

ACS	Association of Caribbean States
AMCEN	Africa Ministerial Conference on the Environment
AMU	Arab Maghreb Union
APEC	Asia -Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
CARICOM	The Caribbean Community and Common Market
CBD	Convention on Biological Diversity
CIS	Commonwealth of Independent States
CGIAR	Consultative Group on International Agricultural Research
CILSS	Permanent Inter-State Committee for Drought Control in the Sahel
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMESA	Common Market for Eastern and Southern Africa
CSD	Commission on Sustainable Development of the United Nations
DESA	Department for Economic and Social Affairs
ECA	Economic Commission for Africa
ECCAS	Economic Community for Central African States
ECE	Economic Commission for Europe
ECLAC	Economic Commission for Latin America and the Caribbean
ECOWAS	Economic Community of West African States
EEZ	Exclusive Economic Zone
EIA	Environmental Impact Assessment
ESCAP	Economic and Social Commission for Asia and the Pacific
ESCWA	Economic and Social Commission for Western Asia
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FIDA	Foundation for International Development Assistance
GATT	General Agreement on Tariffs and Trade
GAW	Global Atmosphere Watch (WMO)
GEF	Global Environment Facility
GEMS	Global Environmental Monitoring System (UNEP)
GESAMP	Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection
GHG	Greenhouse Gas
GIS	Geographical Information Systems
GLOBE	Global Legislators Organisation for a Balanced Environment
GOS	Global Observing System (WMO/WWW)
GRID	Global Resource Information Database
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IAEA	International Atomic Energy Agency
ICSC	International Civil Service Commission

Feasibility Study on the Development of a Regional Water Observation Mechanism in the
Mediterranean Region

ICSU	International Council of Scientific Unions
ICT	Information and Communication Technology
ICTSD	International Centre for Trade and Sustainable Development
IEEA	Integrated Environmental and Economic Accounting
IFAD	International Fund for Agricultural Development

IFCS Intergovernmental Forum on Chemical Safety IGADD Intergovernmental Authority on Drought and Development ILO International Labour Organisation

IMF International Monetary Fund IMO International Maritime Organization IOC Intergovernmental Oceanographic Commission IPCC Intergovernmental Panel on Climate Change IPCS International Programme on Chemical Safety IPM Integrated Pest Management IRPTC International Register of Potentially Toxic Chemicals ISDR International Strategy for Disaster Reduction ISO International Organization for Standardization ITTO International Tropical Timber Organization IUCN International Union for Conservation of Nature and Natural Resources LA21 Local Agenda 21 LDCs Least Developed Countries MARPOL International Convention for the Prevention of Pollution from Ships MEAs Multilateral Environmental Agreements NEAP National Environmental Action Plan NEPAD New Partnership for Africa's Development NGOs Non-Governmental Organizations NSDS National Sustainable Development Strategies OAS Organization of American States OAU Organization for African Unity ODA Official Development Assistance/Overseas Development Assistance OECD Organisation for Economic Co-operation and Development PPP Public-Private Partnership PRSP Poverty Reduction Strategy Papers SACEP South Asian Cooperative Environment Programme SADC Southern African Development Community SARD Sustainable Agriculture and Rural Development SIDS Small Island Developing States SPREP South Pacific Regional Environment Programme UN United Nations UNAIDS United Nations Programme on HIV/AIDS UNCED United Nations Conference on Environment and Development UNCCD United Nations Convention to Combat Desertification UNCHS United Nations Centre for Human Settlements (Habitat) UNCLOS United Nations Convention on the Law of the Sea UNCTAD United Nations Conference on Trade and Development UNDP United Nations Development Programme UNDRO Office of the United Nations Disaster Relief Coordinator UNEP United Nations Environment Programme UNESCO United Nations Educational, Scientific and Cultural Organization UNFCCC United Nations Framework Convention on Climate Change

iv

UNFF United Nations Forum on Forests UNFPA United Nations Population Fund UNHCR United Nations High Commissioner for Refugees UNICEF United Nations Children's Fund UNIDO United Nations Industrial Development Organization UNIFEM United Nations Development Fund for Women UNU United Nations University WFC World Food Council WHO World Health Organization

WMO World Meteorological Organization WSSD World Summit on Sustainable Development WTO World Trade Organization WWF World Wildlife Fund WWW World Weather Watch (WMO)

1. Introduction

The SEMIDE/ EMWIS project has realized the need for a Mediterranean regional observation mechanism. In this context, the Euro Mediterranean Water Directors agreed on studying with voluntary partner countries the objectives and the feasibility of creating, within EMWIS, a Water Observation Mechanism (WOM) for monitoring the indicators towards the achievement of the Millennium Development Goals related to water and sanitation in the Mediterranean Region, as well as the implementation of the 'water' component of the Mediterranean Strategy on Sustainable Development, based on information coming from the upcoming National Water Information System.

The EMWIS Steering Group commissioned consultants to carry out the first step of feasibility studies on the water observation mechanism in four pilot countries, i.e. France, Spain, Tunisia and Jordan, with the aim of formulating a vision and main orientations for this observation mechanism, based, on:

1. A study of the expectations of the regional organizations and national partners concerned;
2. An analysis of the systems for the collection and production of information existing both at the regional and national levels;

The results of the first step (to be validated by the Euro-Med Water Directors during their meeting in Athens between Nov 6th and 7th, 2006), will be followed by a 2nd step which should enable the definition of detailed proposals. During this second step, national studies in other voluntary countries of the Mediterranean region will complement the analysis of existing systems and the study of expectations while refining the overall vision.

CBA was commissioned to carry out the update of the Feasibility Study in Jordan. Two types of questionnaires were provided to the consultant to be disseminated for stakeholders at the national level, with the aim of a) identifying expectations and needs, and b) identify information products, data collection and reporting processes. To this effect, CBA identified main stakeholders and decision makers concerned with water information production, reporting and monitoring. Accordingly, their opinion on the water observation mechanism was gathered via investigations, dissemination of questionnaires to concerned parties and performing documentary analysis.

The outcome of this study is a Feasibility Report that includes a summary assessment of the organizations managing water data at the national level, an analysis of the information production processes in the water sector that allows meeting the international and national information requirements, and an analysis of the opinions and expectations of the decision makers on the mechanism.

The report also includes an update of the information related to water management mentioned in Cyprus Country Profile Report prepared for Johannesburg in addition to the progress made in the National Water Information System (NWIS).

2. Update of the Johannesburg 2002 Report

2.1 CHAPTER 2: INTERNATIONAL COOPERATION TO ACCELERATE SUSTAINABLE DEVELOPMENT IN DEVELOPING COUNTRIES AND RELATED DOMESTIC POLICIES - TRADE

Decision-Making: The Planning Bureau is in charge of the preparation of five-year Strategic Development Plans for the balanced development of the island's economy and has responsibility for the broader coordination of the European Union accession process.

Programmes and Projects: No information available.

Status: In view of the accession of Cyprus to the EU, the Cypriot economy is oriented to a more liberal one, with better macroeconomic returns and significant environmental benefits.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: No information available.

Research and Technologies: No information available.

Financing: No information available.

Cooperation: No information available.

2.2 CHAPTER 17: PROTECTION OF THE OCEANS, ALL KINDS OF SEAS, INCLUDING ENCLOSED AND SEMI-ENCLOSED SEAS, AND COASTAL AREAS AND THE PROTECTION, RATIONAL USE AND DEVELOPMENT OF THEIR LIVING RESOURCES.

Decision-Making: The Cyprus Ports Authority handles oily waters and refuse from ships in port areas. The Ministry of Communications and Works is responsible for shoreline defense; and, the regulations and international conventions on Merchant Shipping. Under the Fisheries Regulations, standards have been adopted for substances in effluent and the environmental quality of recipient seawaters. There are also prohibitions on the disposal of lubricating and other oils and in the use of organotin based anti-fouling paints in the marine environment. **Currently there are two licensed waste oil handlers in the Limassol area.** In order to minimize local effects, aquaculture is now carried out "off-shore."

Amendments to the Fisheries Law (Cap 135) and Fisheries Regulations (1990-

1994) intended to regulate the fishing license system outside territorial waters and the monitoring of fishing activities were passed by the House of Representatives in June 2000. The amendments provide for the obligation of all fishing vessels to secure a fishing license from the Department of Fisheries and Marine Research; the introduction of a high fishing license fee; and the obligation for the installation on all fishing vessels of a blue box for monitoring purposes. In addition, all fishing vessels will be required to call for inspection at a Cyprus port at least once a year, and land at least half of their catch at a Cyprus port. A Fishing Vessel Register has become obligatory. The licensing policy for the fleet fishing in territorial waters takes into consideration the available fishing resources of the area around the island and their sustainable use.

A new Law on Aquaculture, prepared with the help of FAO experts to facilitate a National Action Plan for the Development of Aquaculture, was passed by the House of Representatives in July last year (No.117(I)/2000). A set of regulatory acts relevant to the above law **have been prepared in 2002 and 2003.**

The procedure to regulate the industrial discharge from a number of wineries, in accordance with the Water Pollution Control and the Sewerage Networks laws, has been initiated and waste discharge permits were issued. A Decree on the quality of bathing waters was issued in 2000 under the Water Pollution Control Law. The procedure to regulate the industrial discharge from a number of wineries, in accordance with the Water Pollution Control and the Sewerage Networks laws, has been initiated and waste discharge permits were issued. A Decree on the quality of bathing waters was issued in 2000 under the Water Pollution Control Law.

Cyprus has ratified the following conventions and agreements: the Convention for the Protection of the Mediterranean Against Pollution and the Protocol for the Prevention of Pollution of the Mediterranean by Dumping from Ships and Aircraft; the Protocol for Co-operation in Combating Pollution of the Mediterranean by Oil and Other Harmful Substances in Cases of Emergency; the Convention for the Prevention of Pollution of the Sea by Oil; the Protocol for the Protection of the Mediterranean Against Pollution from Land-based Sources; the Convention for the Prevention of Pollution of Sea from Ships; the Amendments to the Barcelona Convention; the Amendments to the Dumping Protocol of the Barcelona Convention; the Protocol Concerning the Protection of the Mediterranean Sea from Pollution Resulting from the Exploitation and Exploration of the Continental Shelf and its sub-soil of the Barcelona Convention; and the Amendments to the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources.

Programmes and Projects: The degree of pollution and the quality of seawaters are continuously monitored through a number of monitoring and research programmes and projects. Such programmes are the yearly MEDPOL Programmes carried out with assistance and cooperation with UNEP in the framework of MAP.

The Department of Fisheries and Marine Studies is responsible for the implementation of the Directives: i) Habitat Directive (92/43/EC), ii) Water Framework Directive (2000/60/EC) and iii) Nitrate Directive (91/676/EC), in the areas concerning the marine environment.

The entry into the EU has also initiated the introduction of programmes such as:

- In the context of the European Regulation EC1543/2000 a system for the collection of Fishing Data is being put into place.
- The National Strategic Plan for fisheries for 2007 – 2013. In the context of this plan the environmental impact assessment has been completed and published on the 9th October 2006.
- Single Programming Document for Fisheries

The global objectives for the Fisheries Sector, envisaged in the Strategic Development Plan 2004-2006, as well as in the Fisheries SPD, are: to achieve a competitive and sustainable commercial fishing industry, to become capable of offering the consumers with high quality products and meet the market demands and to successfully meet the European and International competition.

During the programming period 2004-2006 the financial allocation for the SPD is 13.142.479 €.

The programme will focus in the following axis:

PRIORITY AXIS 1: ADJUSTMENT OF FISHING EFFORT

PRIORITY AXIS 2: FLEET RENEWAL AND MODERNISATION

PRIORITY AXIS 3: PROTECTION AND DEVELOPMENT OF AQUATIC RESOURCES, AQUACULTURE, FISHING PORT FACILITIES, PROCESSING AND MARKETING, AND INLAND FISHING

PRIORITY AXIS 5: TECHNICAL ASSISTANCE

Other EU funded projects include:

- **MedVeg**, Effects of nutrient release from Mediterranean fish farms on benthic vegetation in coastal ecosystems.
- **Avicenne**: Impacts of aquaculture on marine macrobenthos.
- **MedMPA**: Regional Project for the development of marine protected areas in the Mediterranean.
Life: Special Areas of Conservation (Directive 92/43/EC) in Cyprus: Participation in the part which concerns the wetlands and the marine environment.
LIFE04NAT/CY000013: Focus on the protection and management of some proposed areas for the NATURA 2000.

The levels of heavy metals and organic contaminants are monitored in the marine biota (fish). Marine litter and tar are also monitored. Extensive monitoring of sea water quality is also carried out for the purposes of the Blue Flag scheme. In 2001, Blue Flag Awards were awarded to all the 34 candidate beaches in

Cyprus. For the monitoring and control of vessels longer than 24m which fish in the high seas, Cyprus is now initiating a project to establish an independent system for satellite monitoring of their fishing activities. The system is expected to be operational in early 2002. A Cyprus Vessel Monitoring Station will be in place. See also under **Cooperation**.

Status: Infrastructure and expertise for emergency response to marine pollution incidents is already in place and considered as adequate. For the conservation of fishing resources, several management measures were enacted in 1994, introducing substantial limitations to the fishing effort. Parameters taken into account include the number of vessels, the engine power, closed fishing zones and season, mesh size, etc. The greatest part of the marine waters of Cyprus is of good quality and sea pollution problems are mostly localized within the urban fronts of the three main coastal towns. No industrial effluents are discharged into the sea apart from a number of wineries, the affected area restricted between Limassol's two (2) harbours. At the Department of Fisheries and Marine Research, there is an Inspectorate which carries out regular patrolling of the coastal fishing zone (sea and land patrols) as well as on-the-spot checks at the three ports and six major fishing shelters where nearly all catch is landed.

Capacity-Building, Education, Training and Awareness-Raising: No information available.

Information: See under **Programmes and Projects** .

Research and Technologies: See under **Programmes and Projects** .

Financing: No information available.

Cooperation: A sub-regional contingency plan for preparedness and response to major marine pollution incidents has been established between Cyprus, Israel and Egypt, funded by the EU. The relevant agreement was ratified by the House of Representatives in October 2001 (No. 21(III)/2001). A number of fisheries conventions and agreements will be signed and ratified in the next two years, i.e., General Fisheries Commission for the Mediterranean (GFCM); the 1993 FAO Agreement to promote compliance with International Conservation and Management Measures by Fisheries vessels on the High Seas; the 1995 UN Agreement for the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks; and International Commission for the Conservation of Atlantic Tunas (ICCAT). See also under **Decision-Making**.

2.3 CHAPTER 18: PROTECTION OF THE QUALITY AND SUPPLY OF FRESHWATER RESOURCES: APPLICATION OF INTEGRATED APPROACHES TO THE DEVELOPMENT, MANAGEMENT AND USE OF WATER RESOURCES.

Decision-Making: The Ministry of Health is responsible for the control of drinking water and the microbiological monitoring of recreational waters and carries out research and analytical work on various aspects of pollution with its specialized laboratories in environmental chemistry, microbiology and virology, ecotoxicology and risk assessment. The Ministry of Labour and Social Insurance administers part of the Water Pollution Control Law. Since water is a particularly precious resource in Cyprus, water protection therefore features high in Cyprus' environmental policy.

National water policy focuses on the provision of adequate supplies of water for drinking and residential use, including the tourism and industry sectors, as well as for the development of agriculture. In drought seasons, priority is given to the supply of drinking water, with restrictions in the supply of water for irrigation purposes. Since independence, it has been the goal of government policy to secure ample water supply for irrigation and development in the agriculture, tourism, housing, industry and other sectors, so as to bring about an equilibrium between supply and demand. **The focus of the water policy is now shifting towards water demand management,** Comprehensive legislation was introduced in 1991, targeting the protection of waters from pollution; that is the Law for Water Pollution Control, which is part of the broader legislation for the protection of the environment from all kinds of pollution (industrial or not). The new comprehensive **Water Pollution Control law No.106 (I) 2002 has been passed by the House of Representatives in early 2002.**

Water conservation measures include subsidies for the installation of grey water treatment plants and for the use of inferior quality groundwater for the flushing of toilets and irrigation of house gardens. **These subsidies have been gradually increased over the years and now cover around 75% of the installation cost.** Subsidies are also available to farmers for the collection of the rainwater from the roofs of the greenhouses and for the installation of advanced irrigation systems. Furthermore the Government is also proceeding with the establishment of a Water Authority to manage water on a national scale in an integrated and rational manner. To this respect, legal consultants have completed the drafting of a "Water Entity Bill," which was approved by the Council of Ministers in June 2001 and subsequently submitted to the House of Representatives. **The introduction of a Water Authority is still being discussed.** These water management measures have become a regular feature of water policy in Cyprus over the years but they have been specially strengthened during the last few years. In 1970, the Sewage Systems and Runoff Law was put into effect on the basis of which the Sewerage Boards were introduced, charged with the preparation of plans and the construction of central waste collection and treatment systems within their

assigned area of responsibility.

The Quality of Water Intended for Human Consumption Law was enacted in May 2001 (Law No.87 (I) 2001), fully covering contemporary requirements to safeguard drinking water quality. The quality of groundwater is regulated through the Water Pollution Control Law and a Decree issued in 1996 under this law. A list of substances has been legislated whose direct and indirect discharge into groundwater is prohibited. The Government's policy is to utilize water purification plants to irrigate agricultural crops, green spaces and sports grounds and for aquifer recharging. So as to more fully exploit the treated waste, government policy includes covering the cost for the installation of tertiary treatment systems in all urban waste treatment systems and subsidizing the installation of small tertiary biological treatment units in rural areas by 75-85% of the cost. The texts of a Code of Contact for Good Agricultural Practices and of Quality Standards for the Reuse of Treated Effluent were finalized. Discharges of dangerous substances into surface waters are regulated by a 1993 Decree that prohibits direct discharges and makes indirect discharges subject to a permit, which may be granted under terms and conditions with regard to effluent standards, quantity and place and manner of disposal and of technical, operational, and monitoring specifications and conditions. During 2000 and 2001, ambient quality standards and measurement methods were adopted for mercury, cadmium, hexachlorocyclohexane and other dangerous substances in surface waters.

Programmes and Projects: There is a very extensive programme in place for central sewage systems and waste treatment plants and the reuse of treated effluent. **Major parts of the central sewage systems have been completed and a large number of hotels have been connected with them in the tourist areas. Since 2003 15 Grey Water treatment plants have been installed to army camps. Five Treatment plants are now being built in army camps. A programme for the installation of 80 Grey Water Plants to schools around the island has been initiated in 2006.** There is extensive use of fertilizers and plant protection products, but their holistic control is carried out, through phytosanitary controls, chemical analysis for pesticides residues, IPM and on-going farmer training programmes.

Measures to mitigate nitrate pollution from agricultural sources include: control of fertilizer use; fertigation; use of improved irrigation systems and preparation of irrigation schedules; relocation of animal husbandry units; slurry collection; mechanical separation and appropriate land application of piggery waste; training of farmers; monitoring of groundwater quality; etc. Work was initiated on a project for a major assessment of nitrate pollution of groundwater, the identification of waters polluted or threatened by nitrates pollution from agricultural sources, the delineation of vulnerable zones and the establishment of a regular monitoring programme. In 2000, a project for the monitoring of the quality of waters in reservoirs was completed. It assessed conditions in the eight main water reservoirs and their contributing streams, covering 226 chemical, microbiological and toxicological parameters. A monitoring programme for surface and groundwater near industrial areas is also in place. See also under **Status** .

Status: In the context of the Government's policy, a large number of reservoirs and dams (app. 100) were built for water storage, and the installation of improved irrigation systems has been promoted for water conservation. Between 1960 and 1995, there was an increase in dam capacity from 6 to 300 million cubic metres (Mm³), the ultimate goal being a further increase to 380 Mm³, at which point the utilization of the most important water resources will have been completed. **The construction of additional water works as provided in the Strategic Water Development Plan for the period up to 2015 is also under development.** In line with the above framework Arminou dam has already been constructed, on Diarizos river, the construction of Tamassos Dam on Pediaios river, the construction of Kannaviou Dam on Ezousa river, while the Akaki-Malounda Dam is currently under construction. Also the design of Solea Irrigation Project has already commenced, while other small projects are at the feasibility stage.

In addition to the implementation and subsidization of water conservation measures and the water consciousness development for the proper use of this precious resource, a systematic approach is made to increase demand.

In addition, the implementation of the Water Framework Directive, which resulted following lengthy discussions and negotiations among European Union member states, constitutes an integral part of the government policy. The objective of this Directive is the conservation, improvement and safeguarding of the good condition of water bodies (surface, groundwater and coastal) until 2015 and the development of a river basin management plan at river basin level. To date the available dam capacity is 327.5 million cubic metres (Mm³).

In addition to dams, other sources utilized include the development of ground waters, the construction of irrigation networks, the construction of water facilities for water supply and of irrigation networks for house-to-house water distribution, and sea water desalination. Nicosia has a fully operating central sewerage system. **The Greater Nicosia central sewage system has been under construction since 2003.** The coastal towns of Limassol and Larnaca, are served by central sewerage systems and tertiary level treatment plants. Similar systems **have been completed for** the coastal town of Pafos and the important tourist centres of Paralimni and Ayia Napa. There are also a large number of private biological treatment stations, around 400 of them, installed in hotels and other tourist facilities, as well as other biological units set up in refugee settlements, hospitals and military camps. As regards to rural areas, central sewerage systems have been constructed in a number of villages and more such systems are under implementation. Concerning the disposal of the septic waste overflows from the traditional treatment systems and of the sludge produced at the biological treatment units, in all cities there are stabilization tank systems where septic waste is transferred for disposal. A septic waste and industrial waste treatment plant has also been constructed, to which waste is transferred by **licensed** tanker trucks. Treated effluents of high quality are produced from such

plants.

Although groundwater is generally good, in some parts of the river deposit and coastal plain aquifers there are increased nitrate concentrations due to agricultural and urban development and increased salinity because of over-pumping. Nitrate pollution from agricultural sources is a problem in Cyprus, although the area used for agriculture is relatively small (200 000 ha). While the nitrate content in surface waters is low and the impact on drinking water supply areas is negligible, some eutrophication has been measured. Most of the manure produced is used as soil fertilizer. A central industrial effluent and domestic septage treatment plant is in operation in Nicosia, aimed to serve more than 100 industrial units, the size of which does not justify the construction of individual treatment plants. A central effluent treatment plant was established in the Limassol Industrial Estate. The prolonged drought of the last years drastically reduced the water reserves of the surface and underground reservoirs. In order to eliminate dependency on rainfall and satisfy the increasing water demand, the Government has decided to proceed with the construction of seawater desalination plants. Desalination of seawater was first introduced in April 1997, with the operation of the first desalination plant at Dhekelia, while the second desalination plant, built near the Larnaca Airport, commenced operation in March 2001. The desalination programme envisages the construction of another two plants. Metering at individual household level is universal and virtually the entire population is served with piped water of satisfactory quality. All sources of water supplied for domestic use are regularly monitored for the chemical and bacteriological characteristics of water. Quality of drinking water supplies from water stored in dams (85% of total drinking water quantity) is in full compliance with the World Health Organization (WHO) guidelines and EU standards.

Sampling frequencies at least for certain significant parameters are those defined by the WHO. Systematic control (microbiological and chemical) of the water supplied to cities and villages is carried out. There are also special programmes for the systematic monitoring and pollution control of water supply networks, both for surface and ground waters. Pollutants from non-point sources (i.e. agriculture, urban areas) occasionally cause problems of a temporary nature.

Capacity-Building, Education, Training and Awareness-Raising: Yearly campaigns for raising the “water awareness” of the public towards water conservation proved to be successful and will be continued in the future. Further more, water conservation campaigns have been focused to schools and introduced lectures to students, student Drawing Competitions, publication of yearly calendars with some of the winning drawings etc. The recycling of grey water was also introduced into the curriculum of the ecological schools with the installation of grey water treatment plants.

Information: Groundwater is regularly monitored, and a programme for the

preparation of hydrochemical charts has been initiated in 2004 as part of a GIS System using the ENVIS databank. A report on nitrate pollution of groundwater, based on available data, was prepared in 2000.

Research and Technologies: Use of advanced irrigation technologies by farmers is being encouraged by the government. The use of the MED-Hycos Sattelite System is being used for updated information about rainfall, temperature.

Financing: No information available.

Cooperation: Cyprus is a member of the following programmes

- [I.N.B.O. International Network of Basin Organizations](#)
- [Middle East Desalination Research Center](#)
- [Mediterranean Hydrological Cycle Observing System \(Med - Hycos\)](#)
- [International Commission on Large Dams ICOLD](#)
- [Euro-Mediterranean Information System on the know-how in the Water Sector \(EMWIS\)](#)
- [LIFE \(The Financial Instrument for the Environment\)](#)
- [Unesco Water Portal Weekly](#)
- [UNEP GEMS / Water Programme](#)

2.4 CHAPTER 40: INFORMATION FOR DECISION-MAKING

Decision-Making: The Department of Statistics and Research was renamed into the Statistical Service of Cyprus. The Statistics Law (No. 15(I)/2000), passed in February 2000, forms the legal basis for the collection, production and dissemination of statistical information and includes general provisions governing the statistical system in Cyprus. An environment statistics unit was set up within the Service, with the aim of initiating the production of statistics and indicators on the state of the environment on a systematic basis. The Freedom of Access to Environmental Information Law was passed in July 2000 (No. 125(I)/2000). Facilitating the provision of information to the public, a state of the environment report, and access to environmental information are provided for in the new law. In the new law, provisions were made for the right of the public in acquiring information regarding activities and actions affecting the environment and its protection. This law also provides that the Minister of Agriculture, Natural Resources and Environment has to prepare a state of the environment report

every two years.

Programmes and Projects: A wealth of data has been collected and analyzed, such as through the project, financed by the EUs 'LIFE'-Third Countries programme for: water quality monitoring and assessment; the studies on rural sanitation; domestic solid waste recycling; hazardous waste management; and used oils management. Pertinent data are also collected under the 'LIFE'-financed IPPC, Habitats and Household Recycling projects. The Natural Resources Information and Remote Sensing Centre of the Ministry of Agriculture, Natural Resource and Environment, established with FAO funding, will be better utilized in the inventory and monitoring of natural resources and for parts of the state of the environment, through GIS and satellite data. A programme is currently being prepared by the University of Aegean, expected to be finalized by the middle of 2002, funded by the Ministry of Environment, Physical Planning and Public Works of Greece. Its objective is the establishment of a comprehensive system for the collection, evaluation, storage and dissemination of data and information on environment and sustainable development, in order to ensure full compliance with the information and reporting requirements emanating from the environmental Acquis Communautaire of the European Union, the European Environment Agency activities, EUROSTAT, UN/CSD, and major environmental conventions.

Status: No information available.

Capacity-Building, Education, Training and Awareness-Raising:

Research and Technologies: See under **Programmes and Projects** .

Financing: See under **Programmes and Projects**.

Cooperation: Cyprus has signed the Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. Ratification will be pursued in 2002. See also under

Programmes and Projects.

3. COUNTRY REPORT SUMMARY

3.1 Introduction

The Cyprus consultation contacts started on 30th April 2007 and ended on 9th May 2007. Interviews were conducted in person as well as by telephone with a number of stakeholders.

Analysis of the collected information during interviews and the focus group meeting revealed the following:

- The stakeholders currently have some practical difficulties amongst themselves and with the EU to exchange water information. Some of these problems that hinder the development of NWIS and exchange of water information in Cyprus are:
 - No policies for access or sharing of data
 - Some data are confidential and restricted
 - Unavailability of single system or authority to disseminate all water data
 - Unclear responsibility to "who can access what"
 - No regular updating of information
 - Some data are conveyed by phone and dependant on single persons - individuals
 - Communication is sometimes dependent on personal relationships.
 - Every Director has his own policy on sharing data.
 - Lack of human and financial resources
 - Part of the data is still in hard copies
 - Lack of certain types of data (like private well data)
 - Staff are overwhelmed with responsibilities
 - Unavailability of data base systems at some stakeholders
 - No single person or unit at stakeholder organizations is responsible for info dissemination.
 - Joining the EU has added to stakeholders obligations of dissemination of data, and some progress has been made.
 - Inconsistent data formats and structure
 - Lack of Standard procedures for data exchange
 - Data duplication by a number of stakeholders
 - Existence of a number of similar projects that require the same data cause confusion to the stakeholders.

- The main cause for the unavailability of NWIS in Cyprus is attributed to the following:
 - o Fear of the time, effort and cost of implementing an NWIS system
 - o Lack of financial resources
 - o Lack of Human resources
 - o Slow bureaucratic procedures
 - o Signs of lack of commitment

3.2 ENVIS

- The shared water data system called **ENVIS** between three of the main stakeholders in Cyprus has been completed and contains a major part of the quantitative water information but lacks all other types of information.
- The system was developed by the USGS under a USAID project to warehouse and share information between three of the main stakeholders (WDD, GSD and the meteorological department) but is not accessible by the other stakeholders. The ENVIS system proved difficult to use and some information could not be added. The stakeholders that were using the ENVIS found that it was not user friendly. For this reason the ENVIS platform is being phased out and will be replaced by CYMOS.

3.3 CYMOS

- CYMOS (Cyprus Monitoring System) is a commercial package developed through HYMOS. CYMOS is a database of quantity and quality information on surface water and groundwater. It is part of the *EU/Transition Facility project* "Development of Integrated Water Monitoring Programs and Tools for cost effective monitoring and Assessment to Support Sustainability of Water Resources and the implementation of WFD 2000/60/EC in Cyprus"
- The system is ready for implementation. Initial evaluation will start in June 2007 and will last for 3 months and will be followed by a 1 year of testing and further evaluation. The departments involved will be WDD, SGL, DFMR, GSD. Some of the data generated for ENVIS will be used for this system.
- Water Quality Information is currently collected by seven stakeholders and the information is divided between them. Currently there is no single system to handle and warehouse all the water quality information in Cyprus. Such system does not exist and the only system that exists in the SGL is not adequate for this purpose.

- Main providers of water information in Cyprus are WDD, SGL, GSD and the Meteo department. All stakeholders are unanimously accepting the WDD to be the NWIS National Focal Point.
- Apart from the *CYMOS System* developed under the EU project, none of the stakeholders have near future plans for improving their information systems. This is mainly due to the lack of IT human resources in their departments. The long term plans of stakeholders do not take into consideration the idea of acting as a node under a NWIS.
- The availability of funding through the EU project solves the main obstacle on the road to establish a NWIS. But it is as important to establish a special unit or department under the WDD that is responsible for the NWIS system. It is also important to establish an NWIS committee, where all stakeholders would be represented. Each stakeholder will nominate a representative to act as a member of NWIS committee. This member should have among other responsibilities the role of acting as a liaison officer with the unit or department in WDD that will be responsible for NWIS.
- The NWIS can be hosted by the Ministry of Finance which is already hosting the websites and all other Intranet systems for the governmental bodies.
- The CYMOS System can be the stepping stone for the development of the NVIS platform

3.3 Available water information types

In Cyprus the following water information types exist at the stakeholders that were interviewed and some can be accessed through their web sites:

- Quantitative/maps
- Grey Literature
- Water Legislation/strategies
- Call for Papers/tenders

The following types of information were either reported to be found for the internal use of the stakeholder or only available in hard copies or not available at all. These information are not posted on stakeholders' websites nor their internal systems (when systems are available), these types are:

- Standards and best practices
- Innovative technologies
- Training/conferences

Some quantitative data that are needed by stakeholders (examples are private wells data (quality and quantity)) are either unavailable or not available in one

place or under a system. Other types are collected for a specific purpose and thus can't be used by other departments. Absence of required types of water information presents some obstacles and difficulties for stakeholders in Cyprus

To develop a NWIS in Cyprus, the following road map is recommended:

- 1- Start an awareness campaign between stakeholders at high levels to show the importance of NWIS.
- 2- An initiative for the development of a NWIS has already been started by the transition Facility Project currently funded the EU. All main stakeholders should be part of the initiative and should act as focal points for the NWIS. Decision to join the initiative and commitment to carry out responsibilities given to each stake holder should be taken on a high level.
- 3- An NWIS committee should be established, each stakeholder will nominate a representative to act as a member of NWIS committee. This member should have among other responsibilities the role of a liaison officer with the unit or department in WDD which will be responsible for NWIS. The member will be responsible for updating the information coming from her/his department regularly and on-time.
- 4- Establish a unit under WDD to be responsible for the NWIS and to coordinate between stakeholders.
- 5- Allocate human resources at WDD to coordinate between all stakeholders and be responsible for the continuous updating of NWIS. WDD is the implementing agency of the EU project. WDD has the mandate to be the coordinator for water information in Cyprus and is accepted by all stakeholders.
- 6- Classify information based on sensitivity and confidentiality to:
 - i. Public information
 - ii. Stakeholders' information
 - iii. Internal use information
- 7- Define the types of data that are currently needed but not collected (like data about private wells) and assign the responsibility of data collection and warehousing to the appropriate department.
- 8- Utilize the currently available ENVIS/CYMOS system that is shared between WDD, GSD and Meteorological department as a base for the targeted system.
- 9- Utilize the GIS system available at the GSD and benefit from GSD experience in this regard. It is strongly recommended to include the GSD as a fourth partner under this project.
- 10- Define access and sharing policies for water information. This would eliminate any ambiguity or vagueness to who can access what and does not leave it to the director's decision to release information or not to.
- 11- Develop Standard Operation Procedures for updating and sharing of information.
- 12- Develop the targeted Information system under the financed EU project to be a web based distributed data base system (XML based) making use of

the ENVIS/CYMOS system currently available. In the proposed system every stakeholder (agency) is responsible for the provision, updating and maintenance of its own information. The system should have **dynamic** links to the information systems owned by stakeholders and should provide the facility to warehouse the information taken from different stakeholders who do not have information systems linked under NWIS (like DoA, ES, MSPHS) .

3.4 Difficulties linked to water information access

Some of the problems that hamper the development of NWIS in Cyprus are related to difficulties linked to access to information. Access to information is hindered by such problems related to:

- Data; such as confidentiality of data, lack of standard data exchange formats, data is produced/ exists in hard format and problems in data readiness and reliability because of lack of qualified staff;
- Systems; such as old computers systems and outdated software packages;
- Management; such as the lack of standard operating procedures, unclear roles and responsibilities and the absence of an NWIS management unit;
- Lack of policies for data sharing, and access.
- Lack of commitment and political decision to establish NWIS due to lack of stakeholders' knowledge of the benefits that they can reap from NWIS.

3.5 Difficulties for water information dissemination and exploitation

The main difficulties related to water information dissemination is linked to the absence of NWIS in Cyprus due to such reasons as: absence of political decision to establish such a system, lack of financial resources, and absence of sensitivity classification for data to define the data types that can be shared.

Feasibility Study on the Development of a Regional Water Observation Mechanism in the Mediterranean Region Jordan Diagnostic Study, November, 2006 Page 27 / 40

It is increasingly recognized sector wide, that implementation of a National Water Information System in Cyprus has become imperative and more pressing than ever. In its proposal to establish such a system, CBA has identified the following benefits:

The establishment of a National Information System in Cyprus would achieve the following benefits:

- Help provide coherent reliable water related data and information for monitoring, management and planning of the water sector thus making more informed planning decisions.
- Offer a great opportunity to review and improve the information flows between the various institutions involved in the water sector on the basis of recognized standards.
- Facilitate the provision of data relevant to local and international bodies on the basis of information classes.
- Eradicate data redundancy, duplication and multiple data sources.
- Avoiding the costs of bad decisions based on multiple unreliable data sources.
- Saving of sector leadership's time.
- Saving the cost of processing & maintaining redundant data stores.
- Increasing transparency of information.
- Monitoring and controlling data quality and integrity.
- Provide a tool for a more effective Water Demand Management Policy
- Provide consumers and stakeholders with reliable and easily accessible data

4. Synthesis of Opinion and Expectations of Stakeholders

Concerned stakeholders were interviewed and divided into two groups; decision makers/ data producers and Data Users. Accordingly, their opinions and expectations on the water observation mechanism were gathered. In some organizations opinions were taken from different individuals working at different positions/ departments.

Table 4.1 – Stakeholders Contacted

TYPE	NAME	DISTRICT
Government Organizations	Planning Bureau	Nicosia
Government Organizations	Ministry of Agriculture, Natural Resources and Environment	Nicosia
Government Organizations	Water Development Department	Nicosia
Government Organizations	Ministry of Health	Nicosia
Government Organizations	General Laboratory	Nicosia
Government Organizations	Department of Fisheries and Marine Research	Nicosia
Government Organizations	Ministry of Education and Culture	Nicosia
Semi-Government	Water Board of Nicosia	Nicosia
Semi-Government	Sewage Board of Nicosia	Nicosia
Local Authorities	Union of Cyprus Municipalities	Nicosia
Local Authorities	Lakatamia Municipality	Nicosia
Education Institutions	The University of Cyprus	Nicosia
NGO – Desalination	Caramontanis Engineers	Nicosia
NGO – Local Action	Irrigation Committee Kokkinotrimithia	Nicosia
NGO – Farmers Union	EKA	Nicosia
NGO	Consumers Union	
Press – Journalist	Tasos Koulis	Nicosia
Press – Newspaper	The Philelephteros	Nicosia

4.1 Analysis of Data Producers/ Management Responses

All of the Data producers that were interviewed were asked questions about the following:

- What information do they produce
- How they manage the information produced
- What information do they need from other sources
- In what format do they require this information
- How readily available is the required information
- Their views/ opinion on a central information system
- Their concerns about such a system

All of the interviewed persons were in agreement that such a system would be beneficial to their work. As expected, different organizations gave priority to different types of required information.

The interviews showed that a lot of the available data is in hard format or in a format that is not compatible with the requirements of the organization.

Organizations such as the WDD and the State General Laboratory, are involved in a number of similar projects that require the production of similar or in many case the same information. This seemed to cause some confusion regarding the need for “yet another database”. It also showed, in some cases, the lack of clear leadership or understanding of the requirements of each project.

One major concern about the project is the responsibility about the NVIS and coordination of all the stakeholders. People appeared happy to cooperate and work for it provided they receive the necessary resources, guidance and clear instructions from the management.

Another concern that was mentioned by most interviewed stakeholders was the confidentiality of some of the data and the need for an effective data security mechanism. Furthermore, some of the internal processes of some departments, regarding the publication of data are so time consuming that the availability of up-to date data would not be practical, unless those procedures get simplified.

Data producers felt that the creation or assignment to an organization the role of coordinating the effort, similar to the NFP of EMWIS, would be the ideal start to the project.

4.2 Analysis of Data Users Responses

All of the Data Users that were interviewed were asked questions about the following:

- What information do they need
- In what format do they require this information
- How readily available is the required information
- Their views/ opinion on a central information system
- Their concerns about such a system

The majority of the interviewed stakeholders were very positive about a central information system. They feel that a central information system can help them save time in their search about data and also be able to provide other useful water related information.

Most of the consumers had set a great priority about information about water quality and water price. Also they were interested in subsidy programmes, the scheduled water cuts for summer and information about good water practices. Consumers did not feel the need for a regional database since their interests are local.

The academic and journalistic stakeholders did not have specific information types that were interested in. They liked the idea of a centralized system, but their information needs are not fixed and vary according to the project they work on. The academic and journalistic stakeholders were very positive about the creation of a regional database since the collection and comparison of different data would become a lot easier and efficient.

