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CEDARE Report

By

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TASK-1

- **What are the focus areas for environmental data and information in your institution/ country, or region (as applicable to your case)?**

  The focus areas for environmental data and information in CEDARE are relevant to CEDARE programmes and activities. CEDARE acquires and disseminates data for freshwater resources management, land resources management, urbanization management, and socio-economic data. CEDARE also focus on sustainable development indicators that are relevant to produce regional and sub-regional state of environment reports. CEDARE's data are statistical and geographical referenced data that can be produced in different formats: tabular, graphical and maps format.

- **What is the environmental information needs common across stakeholder groups in your country (region)?**

The stakeholders in the region can be categorized as governmental, civil society and international organizations. Each of the stakeholders has different requirements according not only on the thematic level but also on the detailed required. Governmental organizations are concerned with the following environmental information:

- Monitoring and analyzing the state of environment resources such as water resources, land resources, air pollution, etc…
- Environmental information related to the environmental treaties that the country has signed or negotiating to sign.
- Environmental legislation and environmental institutions restructuring.

Civil societies are concerned with the interaction between the environment and the people. The main concern is how the environment can help in enhancing the citizens' quality of life and reduce poverty. Civil societies are interest in the following:

- Funding opportunities for conducting environmental related projects
- Environmental public awareness activities
- Fresh water, marine environment, desertification, population, biodiversity, conservation, and Environmental management systems are declared the most important priorities by the Forum for Arab NGO's for the WSSD, Manama, 8 September 2001.

International Organizations are concerned with enhancing cooperation among the countries through and providing state of the environment on regional and sub-regional levels. Such, international organizations are interest in environmental information that is relevant to the implementation of Millennium Development Goals (MDG).

CEDARE as an international organization has been acquiring core datasets and indicators for all themes that are needed to develop the African Environment Outlook, Global Environment Outlook, and Arab state of Environment reports. CEDARE currently priorities are water and land resources management, knowledge sharing and management for environment and development information, and trade, invesment and environment issues.

- **Is there a national (regional) environmental information system, initiative, programme, project, etc., that address those needs? When it started and when it will be completed?, who is overseeing it?**

  CEDARE is cooperating with UNEP to develop African Environmental Information System that assists the African countries in environmental assessment and reporting on the country levels. The information system consists of Africa-Sustainable Development Data and Indicators Information System, Africa-Environmental Experts Information System, Africa-Environmental Documents Information System. The project started third quarter of 2003 and expected to end by the end of 2004. CEDARE is overseeing the development and training of this information system.

  UNEP has initiated Africa Environmental Information Network that aims to harness and enhance access to information and knowledge to support the management of Africa's environmental resources as assets for sustainable development. CEDARE is UNEP collaborating center for North Africa that aim to implement AEIN in the North Africa sub-region. Implementation of AEIN is divided into 3 phases, which are not necessarily sequential, but rather to allow the differences in stages of development of countries to be dealt with in a pragmatic and an efficient manner. AEIN phase 1 have started 2003 and expected to end by the end of 2004.

  The Arab Network for Environment and Development (RAED) is a network of Arab non-governmental organizations including more than 200 NGOs from Mauritania, Morocco, Algeria, Tunisia, Libya, Sudan, Egypt, Jordan, Palestine, Lebanon, Syria, Kuwait, Quatar, Bahrain, Oman, Saudi Arabia, and Yemen. The objectives of the network are to coordinate between regional community organizations in the exchange of skills, experience and information, to create new grassroots activities to be implemented by RAED NGO members, to encourage the inclusion of community participation projects in government programs to achieve sustainable development, and to gather, disseminate and exchange regional and international data on different environmental and development problems. The secretariat of the network is the Arab office for Youth and Environment (AOYE).

  Nubian Aquifer Regional Information System is an integrated regional ground water information system that assists the four countries of the aquifer: Chad, Egypt, Libya, and Sudan to manage the aquifer by standardizing data collection and dissemination among the countries of the aquifers. NARIS assists decision makers by providing accurate information about the quality and quantity of the ground water of the aquifer.

- **What are the strengths and weaknesses of current public information systems and services provided in your country (region)?**

  Currently there is a lack of a regional public information system; different efforts have been done to publish regional environmental information through specialized international and regional organizations. There is a need to have Country web portals that disseminate information to the public. Such country environmental web portals will be able to fulfill the required information need by the different stakeholders such as governmental and non governmental organizations.

- **What are the preferred information acquisition methods? Internet, CDs, printed materials, etc.**

  The Arab world is considered one of the least internet using regions of the world, with internet users amounting to only 2.6% of all Arab citizens. Arab content on the internet is also very low. Therefore, the preferred information acquisition is hardcopies materials and CDs.

- **What are the constrains and barriers to access environmental information in your country (region)?**

  The constraints and barriers can be categorized as legislative and technical barriers. Concerning the legislative barriers, the region does not have any convention about sharing environmental information such as the Aarhus convention for Europe. As for technical barriers, data sharing among the countries of the region is still not effective. In addition, The Arab region has low e-readiness indicator that is a major barrier to allow citizens to access electronic information.

- **Is there a national programme or project on environmental indicators? Please provide titles, starting and ending dates, thematic areas covered, indicate whether it has been successful and why?**

  CEDARE has been extensively working on collecting environmental and sustainable development indicators to fulfill the required task in developing regional and sub-regional state of environment reports such as the Global environment outlook and African environment outlook. The current themes that CEDARE is focusing on are NEPAD themes for AEO II.

- **Are there any monitoring programmes aiming at collecting data and filling in data gaps, what the thematic areas it cover?**

  Currently CEDARE is not engaged in any monitoring programmes, although there are regular collection of available sustainable development indicators and core datasets.

- **Does your country (region) produce state of environment (environment outlook) reports? Please give dates produced; what is the information sources being used in producing this report?**

  CEDARE has been involved as UNEP North Africa collaborating center in the development of Global Environment Outlook I, II, and III (1997, 2000, and 2003) and Africa environmental outlook. CEDARE role was to develop sub-regional environment outlook report for North Africa countries. National and international sources have been used to develop the above mentioned reports.

- **Please give recommendation to improve public access to environmental data at the local, national and regional levels (address the following aspects policy, institutional, technical, financial, sustainability).**

  To improve public access to environmental data, the following should be encouraged:

1- Legislations must identify the public rights in receiving environmental related information in reasonable quality and time.
2- Governmental organization must publish regularly reports about the state of the environment.
3- Develop capacity of journalist and mass media national staff on how to integrate environmental data in their regular reporting.
4- Establishing or enhancing national and regional environmental data collection programmes
5- Establishing national environmental information committee to enhance coordination between the governmental organizations relevant to environmental data collection programmes and standardize the methods of data collection and dissemination.
6- Regional organizations should develop or encourage the national authorities to adopt international and regional standards in data collection and dissemination.

TASK-2

Name:
Africa Sustainable Development Data and Indicators Information System Version 2.X (AFRICA-SDIS)

Lead agency:
United Nations Environment Programme and Centre for Environment and Development for the Arab Region and Europe

Purpose, aims, objectives:

The objective of the Africa Sustainable Development Data and Indicators Information System (Africa–SDIS) is to act as a standard information system for the African nations to acquire, process, and disseminate information relevant to sustainable development. A key feature of Africa – SDIS is to assist in developing State of Environment reports on the national, sub-regional and regional levels. Africa-SDIS provides tabular, graphical, and spatial reports.

Users:
The users of the system are the member countries of the Africa Environmental Information Network. Phase 1 consists of institutions in 12 countries and 6 sub region collaborating centers.

Methods - a description of the work done.

Africa – SDIS is developed to handle information about core dataset and indicators relevant to sustainable development. The system is developed to be used as standalone or client/server application. Training for two days has been conducted for the African English speaking countries and the training for the francophone countries will be conducted during November. The system is submitted to the English speaking African countries to start development national and sub regional state of environment reports. The Francophone African countries will receive the training and the system by the fourth quarter of 2004.

Appropriateness of the approach.

The approach is under testing.

Institutional capacity.

Training to AEIN focal points has been conducted for English speaking countries and AFRICA-SDIS is supplied to them.

Outcomes and benefits expected or achieved.

Expected outcomes will be trained staff to use Africa-SDIS and enhancing environmental assessment and reporting capabilities of the participating institutions.

Name:
CEDARE Ground Water Information System – Nubian Aquifer Regional Information System (NARIS)

Lead agency:
Centre for Environment and Development for the Arab Region and Europe

Purpose, aims, objectives:

In cooperation with the Programme for the Development of the Sandstone Nubian Aquifer, CEDARE has developed ground water information system to assist in the management of Nubian Sandstone Aquifer. NARIS assists decision makers and researcher to manage the valuable aquifer. NARIS provides complete information about the quantity and quality of all the available wells in the concerned four countries; Chad, Egypt, Libya, and Sudan. NARIS is designed to be the standard information system to manage the aquifer in the four countries and to facilitate data and information sharing. NARIS provides tabular, graphical, and spatial reports.

The Nubian Aquifer Regional Information System (NARIS) is an integrated Information System developed with a vision to fulfill the following tasks:

- Store, search and retrieve information about the Nubian Sandstone Aquifer System wells such as water levels, draw downs, stratigraphy, hydraulic parameters, etc.
- Provide an integrated regional information system among the countries sharing the aquifer thus ensuring the sharing, exchange and flow of information.
- Assist the decision makers by providing relevant and accurate information about the status of the aquifer within regional and national perspectives.
- Provide a standardized method for data collection and entry among the four concerned countries.
- Identify gaps and overlaps among the existing data and information available.
- Prepare the input parameters which are needed for the modeling at different scales, and calibration of the groundwater model and comparison of the results.

Users:
Responsible national institutions for managing the aquifer in Chad, Egypt, Libya, and Chad

Methods - a description of the work done.

Data from the four countries have been collected and processed. The system maws developed to provide efficient capabilities to search and enter data about the Aquifer wells. The system provides graphical, tabular, and spatial outputs. Each of the above institutions has received training on using and administrating the information system. Training has included capacity building of the technical staff on administrating database management system.

Appropriateness of the approach.

The approach was appropriate to build the capacity of these institutions to cooperate on managing the valuable aquifer.

Institutional capacity.

This system has enhanced the institutions capacity to manage their data and information regarding ground water quality and quantity. It has also enhanced the human resources capacities who received the training. The information system has also increased level of information sharing and dissemination among the four countries.

Outcomes and benefits expected or achieved.

Institutional capacity building is achieved in terms of human resources, Information Systems and Data sharing

Results (impact).

NARIS has increased the awareness of the importance of sharing information about the usage of the aquifer

Effectiveness and efficiency:

NARIS has been considered as an efficient regional information system that can assists the countries in managing their shared ground water resources. Effectiveness of the system depends on its usage by the different organizations and their sharing policy.

Discussion on the results in relation to the intensions.

The intension of developing NARIS was to act as regional information system that can allow the four countries to share management of the Aquifer. NARIS can be replicated to other Aquifer especially to shared aquifers.

Lessons learned and experiences

The main lesson learned that successful cooperation between countries depends on transparent and shared information about the usage of the shared resource. NARIS has been fostering cooperation among the four countries by disseminating and sharing the water quality and quantity of each country sharing the aquifer. CEDARE regional ground water information system can applied to other shared Aquifers.

Name:
CEDARE Geographic Information System

Lead agency:

Centre for Environment and Development for the Arab Region and Europe

Purpose, aims, objectives:

Geographic Information Systems (GIS) were recognized by CEDARE as a key tool to collect, manage, analyze and present environmental information derived from a variety of sources. As an integral part of its system, CEDARE initiated a geographically referenced database. The focus of the data set collected and implemented addresses water resources, land degradation, and urbanization. The selection of the data included was based on relevance, access availability, as well as geographic representation. CEDARE continues to expand its spatial data holdings both vertically, by adding additional data entries to the existing coverage, and horizontally by introducing new geographic areas to cover the entire region.

CEDARE digital maps comprise several levels of details--the Regional level, the Inter-Country level the National level and Hot Spots. Previous plans were set to acquire maps of those levels within certain scale ranges that were deemed acceptable. CEDARE database holds more than 1000 multiple layers covering all CEDARE region.

Users:

CEDARE member countries, Universities and research Centers, NGOs, Private sectors, International Organizations.

Methods - a description of the work done.

CEDARE GIS database has been developed by two phases. The first phase has been concerned with five countries. Data has been collected as digital and hardcopies maps for the five countries. The second phases has expanded to the rest of CEDARE region as adding new geographic areas and adding additional data entries to the existing coverage. The GIS data were regularly updated through CEDARE focal points, regional and national projects and data vendors.

Appropriateness of the approach.

Developing a regional geographic information system faces a lot of constraints and difficulties such as standardization and harmonization of the collected maps. The approach of developing GIS for five countries as pilot phase for the regional GIS has been an appropriate approach. The implementation of the second phase has integrated all the lessons learned during phase one. A needs assessment of country requirements should have conduct prior to the project implementation phase. The approach should have also been based on a demand driven approach to minimize the cost of data collection.

Institutional capacity.

CEDARE has cooperated with the Arab countries in developing and enhancing their capacities in developing and managing national geographic information system. CEDARE has provided training to staff members from ministries of environment and national environmental management institutions in the Arab countries. CEDARE also has provided national and regional geographic layers to the Arab countries as the core database for national geographic information system.

Outcomes and benefits expected or achieved.

Regional geographic information system is the main outcome of this activity that assists in regional analysis and evaluation of region's environment. An integrated standardize GIS for the region is a major outcome of the project.

Results (impact).

The development of CEDARE regional geographic information system has been triggered the importance of using geographic information to manage national natural resources within a regional prospective.

Effectiveness and efficiency:

CEDARE GIS is considered an effective information system that can assist in providing information on regional prospective. The efficiency of CEDARE GIS has lead Environmental System Research Institute (ESRI) to participate with CEDARE in developing CEDARE CD-ROM that holds CEDARE geographic databases and allow users to browse the available national, regional, hotspots layers. A framework for evaluation is required to identify key interactions between GIS and institutional aspects (functions, processes and resources). It is clear that specialists and Organizations in the major areas of the environment have found many valuable uses for the technology. Through information sharing between member countries, GIS specialists and other Extension personnel have developed many applications utilizing GIS as a program needs assessment and program monitoring tool.

Discussion on the results in relation to the intensions.

The development of CEDARE geographic information system has fulfilled its intention of providing regional geographic information that assist in managing regional environmental issues. The information system has been a trigger to establish national environmental geographic information systems within the Arab Countries.

Lessons learned and experiences

Developing regional geographic information system has faced major obstacles during harmonizing and standardizing available geographical referenced data. The need to implement international spatial data infrastructure standards such as the use of ISO 19115 to develop spatial metadata. There is always a need to build and enhance the capacities of staff members working with geographical referenced data to manage natural resources specially shared natural resources such as regional aquifers.

To ensure that GIS can be utilized, plans should address all resource issues related to GIS, including manpower, space, and equipment.

Essential elements of developing any regional GIS project are data collection, data verification, and data maintenance. Member countries should devote adequate resources to ensure that all are accomplished.

Name:
CEDARE Strategic Environmental Information Systems

Lead agency:
Centre for Environment and Development for the Arab Region and Europe

Purpose, aims, objectives:

The objective of SEIS is to assist countries for managing their environmental related information on national levels and assists regional organizations to integrate the data from national node to have a regional prospective. SEIS consists of the following databases and information systems:

- Sustainable Development Indicators Information System
- Environmental Experts and Human Resources Database
- Environmental Institutions Profile Database
- Environmental Institution Activities Database
- Bibliographic Database.

Users:
The system was provided to the following Institutions:

Bahrain:	Ministry of Housing, Municipalities, and Environment
Egypt:	Egyptian Environmental Affairs Agency
	Information and Decision Support Center
Jordan:	General Corporation for Environment Protection (GCEP)
Kuwait:	Environment Public Authority
Syria:	Ministry of Environment
UAE:	Federal Environment Agency

Methods - a description of the work done.

Each of the above institutions has received training on using and administrating the information system. Training was conducted for three days that includes training on Oracle database management system. The information system was provided to all listed countries.

Appropriateness of the approach.

The approach was appropriate to build the capacity of these institutions. The information system was being developed with the intention to build the capacity of CEDARE and the member countries to have a standard regional environmental information system.

Institutional capacity.

This system has enhanced the institutions capacity to manage their data and information. It has also enhanced the human resources capacities who received the training.

Outcomes and benefits expected or achieved.

Institutional Capacity building is achieved in terms of human resources, Information Systems and Data

Results (impact).

SEIS has increased the attention to the importance of having information unit within the main governmental institutions that are managing environmental related activities. SEIS has been distributed since 1996 to the different countries

Effectiveness and efficiency:

The training that was conducted for the participant for the above mentioned institutions was very effective. Efficiency depends on the institutions that are implementing the information system.

Discussion on the results in relation to the intensions.

The intension is to build the capacity of the main national governmental institutions to acquire and mange information concerning sustainable development t indicators, environmental experts and institutions, and activities. The intension was accomplished.

Lessons learned and experiences

The main lesson learned that information unit within the different institutions always need to develop the capacity of their personnel. Major constraint was the transfer of the trained personnel from one position to another to another department. The investment that was done in training will be lost.

Name:
Alexandria Solid wastes Complaints Tracking Information Systems

Lead agency:
Centre for Environment and Development for the Arab Region and Europe

Purpose, aims, objectives:

Alexandria governorate has been a pioneer in privatizing municipal solid waste collections. CEDARE has cooperated with Alexandria governorate in establishing Call center to receive Alexandria citizens' complaints. CEDARE has developed complaints tracking information system (CTIS) that aims to provide an easy tool for storing and retrieving information concerning complaints received by the call center. The CTIS provides different types of outputs that assist decision-makers and technical staff for having reliable and accurate information about the complaints and their status. CTIS assists in the analysis of the complaints received and provide complete information about the frequency and type of complaints. The information system has Arabic Interface as requested by the government of Alexandria.

Users:
Alexandria City governorates – Solid wastes Complaints Call Center Staff

Methods - a description of the work done:

Technical mission has visited Barcelona city to review its call center experience. CEDARE has developed the complaints tracking information system according to the requirements of Alexandria governorates and transfer the experience of Barcelona city. Training has been conducted for the call center staff on using and administrating the system.

Appropriateness of the approach:

The approach has integrated sharing experience from Europe and developing the information system customized for local requirements. The approach is very appropriate for conducting such activity.

Institutional capacity:

This system has enhanced the institutions capacity of Alexandria Governorate in managing and monitoring the performance of the private company responsible for collecting municipal solid wastes. CEDARE has developed and enhanced the governorate capacity in two directions. The first direction human resources capacity was enhanced to use and manage the information system. The second one is developing the infrastructure of the Call center by providing all the required hardware and software.

Outcomes and benefits expected or achieved.

Alexandria Solid wastes Call Center is currently operational.

Results (impact).

The Alexandria Governorate is now able to monitor the performance of the collection of the municipal solid wastes. The governorate is able to respond to the citizens complaints immediately and can monitor the progress of solving the complaints.

Effectiveness and efficiency:

The information system is very effective in terms of providing reliable and actual information about the citizens' complaints. The process of developing the system is efficient as CEDARE have not start the system from scratch but reviewed an existing example in Spain, Barcelona, and developed the system according to Aleandria governorates

Discussion on the results in relation to the intensions.

The call center is considered an important tool to monitor the performance of private companies collecting municipal solid wastes. Reference to the contract between the governorate and the private company, there are fines for the company that does not remove the reasons of complaints within 48 hours. Thus the call center monitors the performance of the company and issue recommendation for fines. This process could not be handled without an information system. The governorate receives on average 300 complaints per day

Lessons learned and experiences

The main lesson learned that information unit within the different institutions always need to develop the capacity of their personnel. Major constraint was the transfer of the trained personnel from one position to another to another department. The investment that was done in training will be lost.

Name:
Decision Support System for Lake Maryout hot spot

Lead agency:
Centre for Environment and Development for the Arab Region and Europe

Purpose, aims, objectives:

The objective of Decision Support System was to analyze the main policy failures behind improper urban management systems leading to deteriorating livelihood conditions. The DSS allowed for derivation of new strategies for sustainable human settlements development and management. The DSS was applied through different methods delegating power to local governments, encouraging private sectors, reconsidering the intended new settlements, changing current legislation, improving the integrated provision of environmental infrastructure, co-ordinating activities of fragmented agencies, …etc.

Users:
Urban planners and environmental specialists

Methods - a description of the work done.

The model used in developing the DSS was able to measure the effects of multiple stresses induced by human activities in Lake Mariout and the surrounding areas. The model has primarily explored the problems in the case study area then it has set a number of criteria, which measures the degree to which the objectives may be achieved. The system allowed Decision makers to compose different SCENARIOS for the different types of external development which may affect the evaluation of the current situation in the study area, the model allowed to built different STRATEGIES by selecting different combinations of measures in the light of the planning objectives, all combinations of STRATEGIES and SCENARIOS were selected for CASE-analysis. Finally a comparison was made between alternative STRATEGIES, as well as the effects of SCENARIO assumptions on the same STRATEGY and values of all CASES were compared.

Appropriateness of the approach.

The approach is very appropriate as the DSS provides different scenarios of solution to the problem. Through which each scenario identifies the pro and con situations

Institutional capacity.

Training to staff and enhancing institutions decision making process

Outcomes and benefits expected or achieved.

Better decision making is the outcome of this information system.

Name:
North Africa Environmental Web Portal

Lead agency:
Centre for Environment and Development for the Arab Region and Europe

Purpose, aims, objectives:

In cooperation with the United Nations Environment Programme (UNEP), CEDARE has developed the above mentioned Web Portal. The objective of the portal is to provide an easy navigation website for environmental information about the North Africa countries (Egypt, Libya, Tunisia, Algeria, Morocco, and Sudan) on the Internet. Top priorities are given to information published locally in these countries. The information on the portal is categorized by countries and by environmental themes. Through country category users have access to environmental-related web sites in each country such as the main environmental governmental body, NGO's, international organizations, experts, country profile, and available environmental information. Through the theme category users are able to locate information related to the specific theme such as available spatial information, relevant institution, experts, etc.

Users:
Environmental Specialists, National institutions, NGos, and youth

Methods - a description of the work done.

The starting page of the website is designed to allow users to go directly to the required information. The welcome page is divided in two sections, Countries and Themes. The countries has direct link to the North African countries web portal; Egypt, Libya, Tunisia, Algeria, Morocco, and Sudan. The second section is a direct link to environmental themes; Land, Forests, Biodiversity, Fresh Water, marine and coastal zones, atmosphere, urban and industrial, socio-economics.

The links in the country section provide links to country profiles, available legislations, institutions, states or governorates, NGOs, education, libraries. Those provide links to the available web sites in North Africa Region. The country profiles provide national and international information about the countries. Then national information links are pointing to available information in the ministries or national institutions. The second category is the Legislation links, which point to the available links to national legislation. The third category is for national institutions web site. This category is divided in the following sections, environmental governmental body, ministries, and national institutions websites. The fourth category is linking to governorates or states web sites. The fifth category is linking to national NGOs web sites relevant to the environment. The sixth category is the Education link that provides access to major universities in the countries. The last link is the libraries link that provides access to national libraries. The web portal is an efficient tool to allocate national and regional environmental related data for the North Africa countries.

TASK-3

Executive summary

The Centre of Environment and Development for the Arab Region and Europe (CEDARE) has been established to build and enhance capacity of its member countries, promoting skills in environmental management, transfer of technologies, environmental education, and development of environmental policies. CEDARE aims to assist member countries to achieve some of their important national and regional priority goals of sustainable development, particularly in the management of freshwater resources; land resources development and urbanization and human settlements. Facilitate inter-country cooperation and exchange of information and experience.

CEDARE methodological approach for enhancing the capacity of the Arab region in managing and analyzing environmental data and information has been depended on three components. The first component is to enhance the human resources capacity, the second one is to enhance and build the environmental information systems infrastructure. The third component is to acquire and disseminate environmental data and information.

CEDARE through its Environmental Information Unit (EIU) has been engaged for the last decade in establishing environmental information units within the ministries responsible of the environment or the main governmental environment affairs organizations. EIU has succeeded to influence the establishment of these important information units within the Arab region. In addition, EIU has been always engaged in building the human resources capacity in the Arab countries to manage and analyze environmental data and information.

CEDARE has been cooperating with different regional and international organizations in conducting projects related to environmental information. The United Nations Environment Programme (UNEP) and the Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA) are main partners in conducting environmental information projects.

The report recommends the following:

- Developing Regional Environmental Information Accessing and Sharing convention
- Enhancing legislations to emphasis the public rights in receiving environmental related information in reasonable quality and time.
- Governmental organizations should publish regular reports about the national state of the environment.
- Establishing national environmental information committee to enhance coordination between the governmental organizations relevant to environmental data collection programmes and standardize the methods of data collection and dissemination.
- Establishing regional environmental information trust fund

Introduction and Background

The Centre for Environment and Development for the Arab Region (CEDARE) was established in 1992 as an international organization, in response to the convention adopted by the Council of Arab Ministers Responsible for the Environment (CAMRE) in Damascus in 1991, and upon the initiative of the Arab Republic of Egypt, the United Nations Development Programme, and the Arab Fund for Economic and Social Development (AFESD).

CEDARE's main mission is to build and enhance capacity of its member countries, promoting skills in environmental management, transfer of technologies, environmental education, and development of environmental policies. CEDARE aims to assist member countries to achieve some of their important national and regional priority goals of sustainable development, particularly in the management of freshwater resources; land resources development and urbanization and human settlements. Facilitate inter-country cooperation and exchange of information and experience.

CEDARE continues its march, ten years after it was established, with renewed determination, and in cooperation with all partners, to emphasize that its priorities and goals are based on the various covenants adopted by the international community and the priorities set by the Arab states in the Arab Initiative on Sustainable Development, as presented by the Arab states to the WSSD in Johannesburg, in addition to the commitment to strive to achieve the MDGs, and the importance of addressing emerging issues such as those of trade and environment, bio-safety, intellectual property rights, peace and the environment, eco-safety and others

CEDARE has been promoting since its launching the importance of environmental information to assist decision makers in the region. CEDARE has established the Environmental Information Unit (EIU) with the following mandate:

- To Provide CEDARE a tool for reliable environmental assessment, monitoring, identification of environmental concerns, trends, root causes, emerging issues and policy responses in the region.
- Assist the creation and strengthening of national EIS programmes.
- Foster cooperative and coordinated efforts for the production of environmental information in the region.
- Act as a clearing house for the dissemination and exchange of environmental information.
- Coordinate and promote data harmonization and standardization, and influence data collection methodologies.
- Use of environmental information to mobilize and augment public opinion.
- Development of sound environmental information technology projects at the national and regional levels.
- Establish a regional environmental information network that offers shared access to distributed databases located at various institutions, and links between the actors in the environmental field in the region.

The Environmental Information Unit has been engaged for the last decade in establishing environmental information units within the ministries responsible of the environment or the main governmental environment affairs organizations. EIU has succeeded to influence the establishment of these important information units within the Arab region. In addition, EIU has been always engaged in building the human resources capacity in the Arab countries to manage and analyze environmental data and information.

CEDARE aims for the next 5 years to work with all partners to support the institutional bodies capable of assimilating, acquiring and disseminating knowledge in the fields of sustainable development. CEDARE continues to employ communication and information technologies to establish and develop environmental information systems, in particular those that help to monitor and analyze data, and state of environment indicators, and disseminate them to enhance popular participation and transparency with the aim of raising environmental awareness and supporting decision making processes.

Methodological approach

CEDARE methodological approach for enhancing the capacity of the Arab region in managing and analyzing environmental data and information has depends on three components. The first component is to enhance the human resources capacity, the second one is to enhance and build the environmental information systems infrastructure. The third component is to acquire and disseminate environmental related data and information.

The first component has been focusing on providing advanced training for the Arab regions human resources. Tailored training courses and workshops have targeted technical staff, middle-management, and decision makers within the ministries of environment and main governmental environmental affairs organizations. The training courses mandate has been focusing on exposing the participant to international, regional, and national experiences in managing environmental data on thematic and geographic levels.

The second component has focused on developing environmental information systems and provides them to the main governmental institutions responsible for managing the environment such as ministries of environment or specialized national institutions. The aim was to build the institutions capacity and work towards standardizing and harmonizing environmental information systems.

The third component has been concentrating on compiling and development environmental data and information especially geographic referenced data. CEDARE has developed a regional geographic database of more than 1000 complex layer such as water resources, land degradation, and urban development. CEDARE has developed “CEDARE CD” to disseminate the CEDARE GIS databases.

Status of environmental data and information.

Analysis of existing initiatives, programmes, projects, systems, and networks.

CEDARE has been engaged in developing and managing measurable quantity of projects and environmental information systems. CEDARE’s environmental information systems cover different thematic and management areas. The following are examples of the developed information system that are relevant or can be replicated to the West Asia.

1. *Africa Sustainable Development Data and Indicators Information System Version 2.X (AFRICA-SDIS)*

Based on previous experience of CEDARE to develop sustainable development indicators information system, the United Nations Environment Programme (UNEP) is cooperating with CEDARE to develop AFRICA-SDIS. The objective of the Africa Sustainable Development Data and Indicators Information System (Africa–SDIS) is to act as a standard

information system for the African nations to acquire, process, and disseminate information relevant to sustainable development. A key feature of Africa – SDIS is to assist in developing State of Environment reports on the national, sub-regional and regional levels. Africa-SDIS provides tabular, graphical, and spatial reports. AFRICA-SDIS first phase targets the 12 member countries of Africa Environmental Information Network (AEIN) phase 1.

Africa – SDIS is developed to handle information about core dataset and indicators relevant to sustainable development. The system is developed to be used as standalone or client/server application. AFRICA-SDIS has multi-lingual user interface: English, French, and Arabic.

2-CEDARE Ground Water Information System – Nubian Aquifer Regional Information System (NARIS)

In cooperation with the Programme for the Development of the Nubian Sandstone Aquifer, CEDARE has developed ground water information system to assist in the management of Nubian Sandstone Aquifer. NARIS provides complete information about the quantity and quality of all the available wells in the concerned four countries; Chad, Egypt, Libya, and Sudan. NARIS assists decision makers and researcher to manage the valuable aquifer. NARIS is designed to be the standard ground water information system in the four countries and to facilitate data and information sharing. NARIS provides tabular, graphical, and spatial reports to meet all requirements.

The Nubian Aquifer Regional Information System (NARIS) is an integrated Information System developed with a vision to fulfill the following tasks:

- Store, search and retrieve information about the Nubian Sandstone Aquifer System wells such as water levels, draw downs, stratigraphy, hydraulic parameters, etc.
- Provide an integrated regional information system among the countries sharing the aquifer thus ensuring the sharing, exchange and flow of information.
- Assist the decision makers by providing relevant and accurate information about the status of the aquifer within regional and national perspectives.
- Provide a standardized method for data collection and entry among the four concerned countries.
- Identify gaps and overlaps among the existing data and information available.
- Prepare the input parameters which are needed for the modeling at different scales, and calibration of the groundwater model and comparison of the results.

Data from the four countries have been collected and processed. The system has been developed to provide efficient capabilities to search and data entry about the Aquifer wells. The system provides graphical, tabular, and spatial outputs. Each of the above institutions has received training on using and administrating the information system. Training has included capacity building of the technical staff on administrating the database management system of NARIS.

3-CEDARE Strategic Environmental Information Systems(SEIS)

The objective of SEIS is to assist countries for managing their environmental related information on national levels and assists regional organizations to integrate the data from national node to have a regional prospective. SEIS consists of the following databases and information systems:

- Sustainable Development Indicators Information System
- Environmental Experts and Human Resources Database
- Environmental Institutions Profile Database
- Environmental Institution Activities Database
- Bibliographic Database.

This information system has been provided to the main governmental environmental affairs institutions in Bahrain, Egypt, Jordan, Kuwait, Syria, and UAE. Technical staffs from these institutions have received training on using and administrating SEIS.

4-CEDARE Geographic Information System

Geographic Information Systems (GIS) were recognized by CEDARE as a key tool to collect, manage, analyze and present environmental information derived from a variety of sources. As an integral part of its system, CEDARE initiated a geographically referenced database. The focus of the data set collected and implemented addresses water resources, land degradation, and urbanization. The selection of the data included was based on relevance, access availability, as well as geographic representation. CEDARE continues to expand its spatial data holdings both vertically, by adding additional data entries to the existing coverage, and horizontally by introducing new geographic areas to cover the entire region.

CEDARE digital maps comprise several levels of details--the Regional level, the Inter-Country level the National level and Hot Spots. Previous plans were set to acquire maps of those levels within certain scale ranges that were deemed acceptable. CEDARE database holds more than 1000 multiple layers covering all CEDARE region.

CEDARE GIS database has been developed by two phases. The first phase has been concerned with five countries. Data has been collected as digital and hardcopies maps for the five countries. The second phase has expanded to the rest of CEDARE region as adding new geographic areas and adding additional data entries to the existing coverage. The GIS data were regularly updated through CEDARE focal points, regional and national projects and data vendors.

Developing a regional geographic information system faces a lot of constraints and difficulties such as standardization and harmonization of the collected maps. The approach of developing GIS for five countries as pilot phase for the regional GIS has been an appropriate approach. The implementation of the second phase has integrated all the lessons learned during Phase one. A needs assessment of country requirements should have conduct prior to the project implementation phase. The approach should have also been based on a demand driven approach to minimize the cost of data collection.

CEDARE has cooperated with the Arab countries in developing and enhancing their capacities in developing and managing national geographic information system. CEDARE has provided training to staff members from ministries of environment and national environmental management institutions in the Arab countries. CEDARE also has provided national and regional geographic layers to the Arab countries as the core database for national geographic information system. The development of CEDARE regional geographic information system has been triggered the importance of using geographic information to manage national natural resources within a regional prospective.

Developing regional geographic information system has faced major obstacles during harmonizing and standardizing available geographical referenced data. The need to implement international spatial data infrastructure standards such as the use of ISO 19115 to develop spatial metadata. There is always a need to build and enhance the capacities of staff members working with geographical referenced data to manage natural resources specially shared natural resources such as regional aquifers. To ensure that GIS can be utilized, plans should address all resource issues related to GIS, including manpower, space, and equipment. Essential elements of developing any regional GIS project are data collection, data

verification, and data maintenance. Member countries should devote adequate resources to ensure that all are accomplished.

5-Alexandria Solid wastes Complaints Tracking Information Systems

Alexandria governorate has been a pioneer in privatizing municipal solid waste collection. CEDARE has cooperated with Alexandria governorate in establishing Call center to receive Alexandria citizens' complaints. CEDARE has developed complaints tracking information system (CTIS) that aims to provide an easy tool for storing and retrieving information concerning complaints received by the call center. The CTIS provides different types of outputs that assist decision-makers and technical staff for having reliable and accurate information about the complaints and their status. CTIS assists in the analysis of the complaints received and provide complete information about the frequency and type of complaints. The information system has Arabic Interface as requested by the government of Alexandria.

Technical mission has visited Barcelona city to review its call center experience. CEDARE has developed the complaints tracking information system according to the requirements of Alexandria governorates and has transfered the experience of Barcelona city. Training has been conducted for the call center staff on using and administrating the system.

This system has enhanced the institutions capacity of Alexandria Governorate in managing and monitoring the performance of the private company responsible for collecting municipal solid wastes. CEDARE has developed and enhanced the governorate capacity in two directions. The first direction human resources capacity was enhanced to use and manage the information system. The second one is developing the infrastructure of the Call center by providing all the required hardware and software.

The call center is considered an important tool to monitor the performance of private companies collecting municipal solid wastes. Reference to the contract between the governorate and the private company, there are fines for the company if it does not remove the reasons of complaints within 48 hours. Thus the call center monitors the performance of the company and issue recommendation for fines. This process could not be handled without an information system. The governorate receives on average 300 complaints per day.

Data and information availability (collectively, sectoral and thematic)

CEDARE has been always promoting dissemination and sharing of environmental data and information. CEDARE has compiled its GIS databases and has published them though CEDARE–CD. The digital database has three levels; the CEDARE region wide level, the national level, and the hot spot level. The Regional level is made up of DCW basemap data and other thematic environmental data sets from several sources. The national level data is comprised of individual country level data sets, some of which came from the DCW and ArcAtlas data and are available for all countries in the CEDARE region. Other specialized national data sets are available for seven countries. These data were obtained by CEDARE from national sources in hard copy forms and were automated into digital data. The hot spot level data comprises data sets on selected study areas that required the development of specialized data. There are currently three hot spots in the product.

The CEDARE CD-ROM product contains a data viewer called the "GIS Data Viewer," which was developed using the 3.1 version of the ArcView Data Publisher. This GIS Data Viewer contains digital maps for all regional, national, and hot spot level data, as well as on-line data documentation in the form of a Windows help file. The viewer was also customized

to provide password access by country to all of the National Maps originated from national sources at the National level data and to all of the data for Palestine.

Public Access.

CEDARE has been engaged in enhancing public access for environmental information. CEDARE disseminates information through hardcopies and electronically media. CEDARE publishes periodical chronicle and disseminate it for free to all registered users. Disseminating environmental information electronically to the public is an important activity CEDARE performs. CEDARE website is one of the means to disseminate information about the available information resources. CEDARE also has developed on 1998 the first Arab environmental web portal that link to available web resources about the environment in the Arab Region. CEDARE also has developed North Africa environmental web portal to disseminate information about published environmental information.

Information policy and legislations.

Although CEDARE's information policy is biased towards disseminating environmental information without any constraints but some of the data sources has their own restrictions on such policy. CEDARE always try to fulfill the data sources requirements such as some countries provide their data to be integrated in the regional platform. Using this data by others would require permission from the country, after which username and password are supplied to the specified user.

There are constraints and barriers to provide free access information. These barriers can be categorized as legislative and technical barriers. Concerning the legislative barriers, the region does not have any convention about sharing environmental information such as the Aarhus convention for Europe. As for technical barriers, data sharing among the countries of the region is still not effective. In addition, The Arab region has low e-readiness indicator which is a major barrier to allow citizens to access electronic information.

Institutional capacity for managing environmental data and information.

For the last decade, CEDARE has been involved in developing and enhancing institutional capacity of the Arab ministries responsible of the environment and main governmental bodies responsible for environmental affairs. CEDARE has been promoting during this period the establishment of environmental information unit that can assist decision-makers with valuable and efficient environmental information. CEDARE has three components: first component focuses on enhancing human resources capacities to manage and use environmental information, Second component concentrates on providing the Arab countries with environmental information systems to be the core of standard and harmonized regional environmental information network. The third component focuses on collecting and processing data and information for the Arab region and enhances institutions capacity by providing them with relevant data and information or their environmental information units.

Financing of environmental data and information.

For the duration of 1994 -1999 CEDARE has been financing most of its environmental data and information activities. Starting of 2000, CEDARE has been establishing partnership with other important organizations such as UNEP to conduct environmental data and information activities. There are major sponsors organization within the West Asia region that are able to provide financial support to environmental data and information activities such as the Islamic

development bank, Arab Fund for Economic and Social Development. The Mediterranean Countries in West Asia are eligible to receive funds from the European Union under the Six framework programme.

Effectiveness and efficiency of current information systems (include strengths and weaknesses).

Current information systems effectiveness and efficiency depends on the awareness available among decision-makers in using environmental information. As the decision-makers are more aware of the importance of using environmental information, they trigger the establishment of effective and efficient environmental information systems. With the decrease of such awareness, the development of environmental information system will never be neither effective nor efficient. There are good examples through out the region of having efficient environmental information systems but with no effect on the decision-making process.

Constrains and barriers to manage and improve availability and accessibility of environmental data and information.

The constraints and barriers to manage and improve availability and accessibility of environmental data and information can be categorized as legislative and technical barriers. Concerning the legislative barriers, the region does not have any convention about sharing environmental information such as the Aarhus convention for Europe. As for technical barriers, data sharing among the countries of the region is still not effective. The rate of changes of trained human resources is very high. This leads to the loss of acquired knowledge within organizations. In addition, The Arab region has low e-readiness indicator that is a major barrier to allow citizens to access electronic information.

Assessment of general requirements:

Environmental priority issues

The Global Environment Report (GEO-3) has indicated that the environmental priority issues for West Asia region are as follows:

- Conservation and protection of freshwater resources
- Land degradation and food security
- Conservation of coastal zones and marine areas
- Air pollution
- Hazardous wastes

Priority environmental information needs of various groups (stakeholders) to support decision-making

The stakeholders in the region can be categorized as governmental, civil society and international organizations. Each of the stakeholders has different requirements according not only on the thematic level but also on the detailed required. Governmental organizations are concerned with the following environmental information:

- Monitoring and analyzing the state of environment resources such as water resources, land resources, air pollution, etc…
- Environmental information related to the environmental treaties that the country has signed or negotiating to sign.
- Environmental legislation and environmental institutions restructuring.

Civil societies are concerned with the interaction between the environment and the people. The main concern is how the environment can help in enhancing the citizens' quality of life and reduce poverty. Civil societies are interest in the following:

- Funding opportunities for conducting environmental related projects
- Environmental public awareness activities
- Fresh water, marine environment, desertification, population, biodiversity, conservation, and Environmental management systems are declared the most important priorities by the Forum for Arab NGO's for the WSSD, Manama, 8 September 2001.

International Organizations are concerned with enhancing cooperation among the countries through and providing state of the environment on regional and sub-regional levels. Such, international organizations are interest in environmental information that is relevant to the implementation of Millennium Development Goals (MDG).

CEDARE as an international organization has been acquiring core datasets and indicators for all themes that are needed to develop the African Environment Outlook, Global Environment Outlook, and Arab state of Environment reports. CEDARE currently priorities are water and land resources management, knowledge sharing and management for environment and development information, and trade, investment and environment issues.

Technological needs

Although most of the environmental institutions in the region countries have advanced information systems infrastructure, but there is a need to harmonize and standardize the available information systems to be able to share data and information especially about shared resources. CEDARE has been always promoting the use of state-of-the-art information systems infrastructure such databases management systems, geographical information systems, and remote sensing information systems.

Another issue is the use of ICT in conducting e-learning activity. This approach is considered an efficient and effective approach in building capacity of human resources. CEDARE's experience during the last decade in building the human resources capacity in managing and using environmental information system has showed that a great number of participants have moved to a higher positions or another sectors. This change has affected the conserving of gained knowledge within the institutions. Thus E-learning would provide higher rate for conducting training courses to new staff members.

Institutional needs (including training and finance)

There is a need to increase the budget of the environmental sector in West Asia countries to be able to have more staff members capable to manage and to use the current and future environmental information systems. The rate of advancement in Information and communication technology (ICT) is very high. This would require regular training to the available staff members on the latest achievements of ICT and their use in developing and upgrading environmental information system. The upgrading activity of the software and hardware of such systems must have allocated yearly budget for this activity.

Regional and international cooperation (including UNEP and other UN agencies).

CEDARE has been cooperating with different regional and international organizations in conducting projects related to environmental information. CEDARE is UNEP's North Africa collaborating centre for developing the Global Environment Outlook (GEO) and Africa

environmental outlook series. CEDARE and UNEP are cooperating in developing Africa sustainable development data and indicators information system that will be distributed to all the African nations to act as the standard environmental information system of Africa. CEDARE and the regional organizations for the conservation of the Red Sea and Gulf of Eden are establishing geographical information system for the Red sea and gulf of Eden. CEARE has been cooperating with all the West Asian countries in developing and enhancing their capacity in establishing environmental information systems. CEDARE is also starting to cooperate with the Regional Organization for Marine protection (ROPME) to develop ROPME integrated information system

Opportunities for the future.

There are great opportunities for cooperation on national, regional, and international levels. The advancements in ICT have provided means of communication and information sharing that was not available in the past two decades. The efficient use of such technologies in establishing environmental information system would enhance the process of environmental decision making. The regional cooperation is needed more than any previous duration; there are countries in the region that share vital natural resources specially water resources. Such vital natural resources need efficient and effective methods for managing the shared resources that can only be implemented by proper use of ICT.

Lessons learned and experiences.

The main lesson that is learned is the importance of having trained and skilled human resources. There is always a need to enhance the skills of the available human resources to manage and use environmental information systems. Another important experience is the need to involve more civil societies in the process of environmental information collection and dissemination. Civil society organizations are one of the main stakeholders in conserving the environment.

Recommendations of priorities for action. Please consider the following:

Policy

- Developing Regional Environmental Information Accessing and Sharing convention that enhance the regional partnership in sharing environmental information

- There is a need to clearly recognize public rights to access environmental information. Legislations must emphasis the public rights in receiving environmental related information in reasonable quality and time.

- Governmental organizations should publish regular reports about the national state of the environment.

Institutional.

- Establishing national environmental information committee to enhance coordination between the governmental organizations relevant to environmental data collection programmes and standardize the methods of data collection and dissemination.

Technical

- Establishing or enhancing national and regional environmental data collection programmes

- Conducting regular training activities to staff members that are responsible for managing and using environmental information system.

Financial

- Establishing regional environmental information trust fund that can support the implementation of regional environmental information projects. The aim of the projects should enhance data and information collection programmes and enhance access to environmental information.