Regional study

Abu Dhabi Global Environmental data Initiative

(AGEDI)

Experience ,Practices and Status of Environmental Data and Information systems In ACSAD

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I- Executive summary

ACSAD has started to develop several data bases on water resources ,Plants and Soil since more than 10 years. All the databases are linked to GIS (ARC View and ARC- INFO) which helps in producing different thematic maps and sheets.

- ACSAD works closely with national concerned institutions and regional organizations. ACSAD has been involved in various regional projects of cooperation with regional and international organizations, such as UNCCD activities , UNESCO ,FAO .

- The sustainability of the information systems depends on the availability of funds or projects implemented in the region ,by which some funds can be provided to maintain and develop the information system .

- It depends also on the willing of national institutions to cooperate and facilitate the flow and exchange of information .The public access to the data and information system in ACSAD is free of charge .

II-Background :

- The Arab countries share a number of physical, social and institutional characteristics.
- Most of the countries of the region are facing critical problems of environmental degradation which, based on current trends are getting worth. Loss of productive arable land, rangelands and forests. Depletion or decline in the quality of water resources and loss or damage of ecosystems and species, extension of desertification are some of the aspects of this environmental degradation .

- Since water and arable land scarcity are the fundamental constraints to future economic growth in the Arab region, a sustainable development require a careful management with more attention given for monitoring and enforcement of environmental information system .Such system will help in assessing and monitoring the trend in the evolution of the environmental system.

But the cause for concern, however in the region, is not only the precise information about the natural resources assessment monitoring and availability .It is rather, the accessibility to available data and information and the flow of that information from producers to users .

- The main purpose of this report is to present the state of the art regarding the existing and functioning of environmental data and information system in ACSAD (The Arab Center for the Studies of Arid Zones and Dry Lands) as a regional organization dealing with the enhancement of knowledge and generation of information required for promoting sustainable agriculture development and preservation of the environment in the Arab region. An overview on the existing information systems and initiative in ACSAD and the Arab region is described below .

- One of the main objective of the integrated environmental assessment is to provide information to help decision makers to understand and follow the state of the environmental resources and relate the findings to appropriate management decision .
- Through building an appropriate information system ,we can identify ,follow and understand effects of nature and human actions on the biophysical and socio-economic environments to be effected .

III-Analysis of existing initiatives, programmes, projects, systems and network in ACSAD :

A- *Arab data base for Arid Zones Plants*

B- *Arab Water Resources Data Base*

C- *Regional data base on Sustainable Vegetation Cover Management in West Asia TN 2*

D- *Regional data base on sustainable water management in West Asia TN1*

E- *Regional Thematic Network in Water Resources Management for Agriculture in Arid Semi Arid and Dry sub humid Area(TPN4))*

F- *Long Term Ecological Monitoring Observatories Network in East Mediterranean ROSEEM*

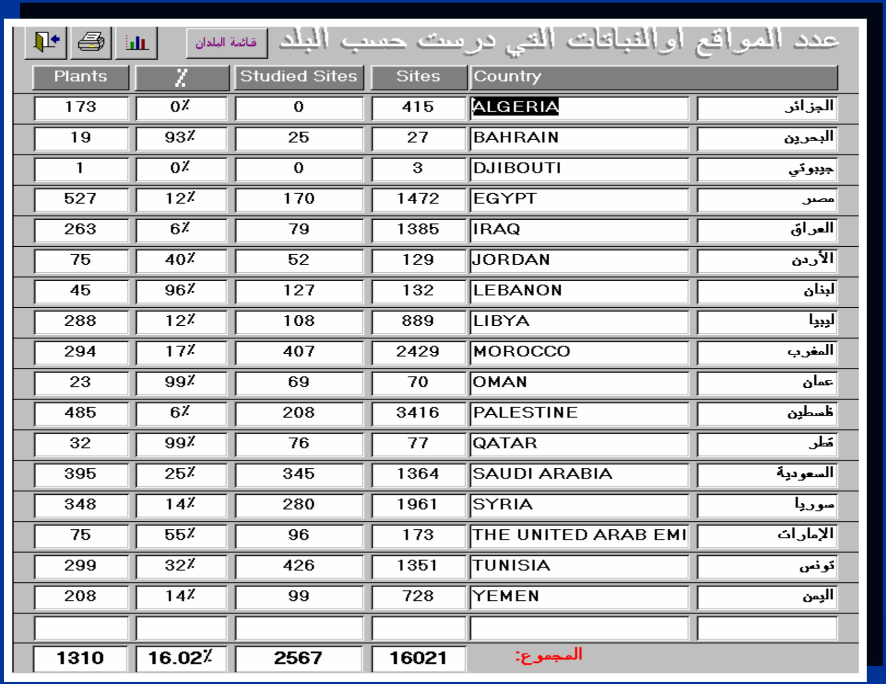
G- *Desertification Assessment and Monitoring System*

H- *Wadi hydrology Network and Groundwater Protection Network*

A- Arab data base for Arid Zones Plants

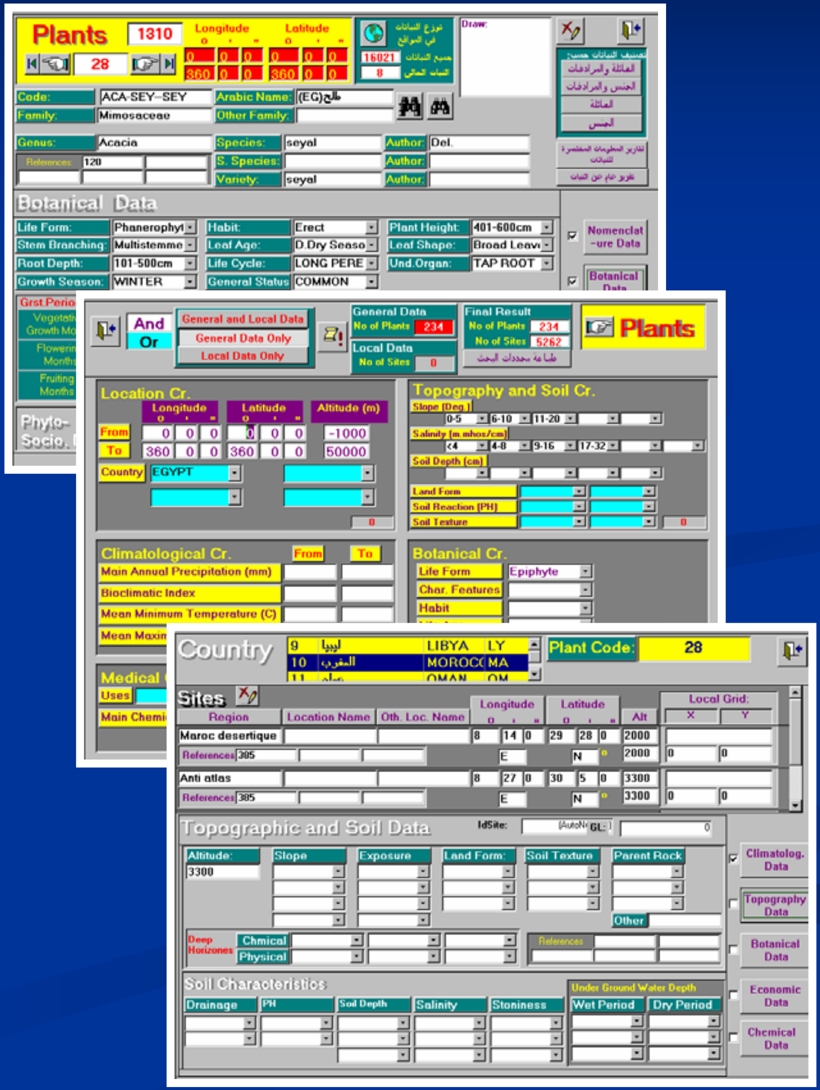
- **A data base for arid zones plants (ADAP) project has been initiated in 1993 .It aims to prepare a comprehensive and intimately integrated data base management system that store and retrieve data related to plants in arid Arab region.**
- **A list of thousand of plant species representing the flora in the Arab countries has been prepared to work on during the first phase .The selection of the plant species was done according to special criteria which gave the species a certain importance in arid and semi arid areas .**

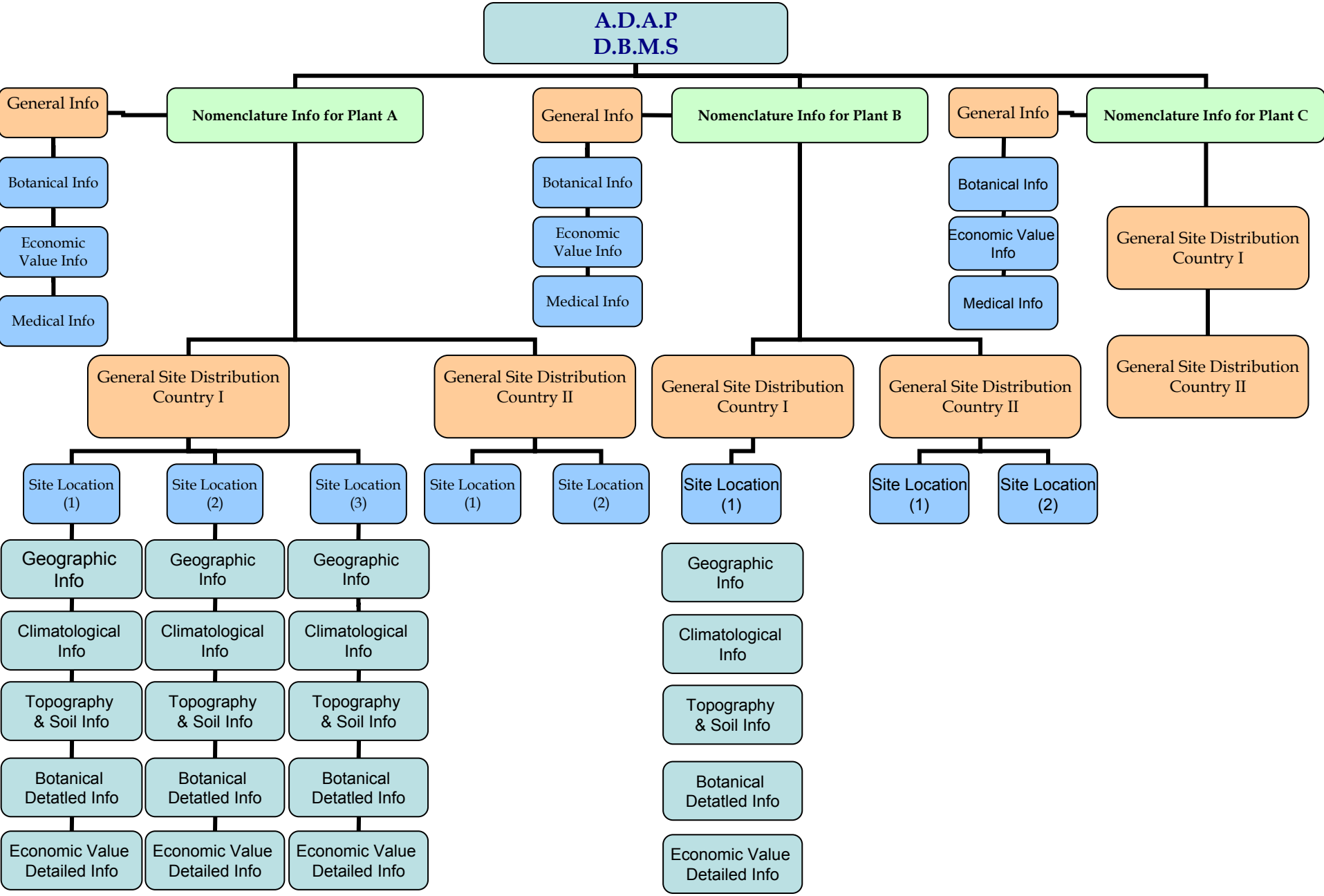
- The importance of the species in sand dune fixation ,erosion control, maintenance of wild life and economic plant genetic resources were also taken into account for the selection .Geographic distribution of the species its tolerance to salinity and resistance to drought , plant pests and disease were also taken in consideration. A thesaurus has also been prepared which relates each plants scientific name to its own collection name.



عدد المواقع والنباتات التي درست حسب البلد

Plants	٪	Studied Sites	Sites	Country	
173	0٪	0	415	ALGERIA	الجزائر
19	93٪	25	27	BAHRAIN	البحرين
1	0٪	0	3	DJIBOUTI	جيبوتي
527	12٪	170	1472	EGYPT	مصر
263	6٪	79	1385	IRAQ	العراق
75	40٪	52	129	JORDAN	الأردن
45	96٪	127	132	LEBANON	لبنان
288	12٪	108	889	LIBYA	ليبيا
294	17٪	407	2429	MOROCCO	المغرب
23	99٪	69	70	OMAN	عمان
485	6٪	208	3416	PALESTINE	فلسطين
32	99٪	76	77	QATAR	قطر
395	25٪	345	1364	SAUDI ARABIA	السعودية
348	14٪	280	1961	SYRIA	سوريا
75	55٪	96	173	THE UNITED ARAB EMI	الإمارات
299	32٪	426	1351	TUNISIA	تونس
208	14٪	99	728	YEMEN	اليمن
1310	16.02٪	2567	16021	المجموع:	




A.D.A.P
D.B.M.S
General Info
Nomenclature Info for Plant A
General Info
Nomenclature Info for Plant B
General Info
Nomenclature Info for Plant C
Botanical Info
Economic Value Info
Medical Info
Botanical Info
Economic Value Info
Medical Info
Botanical Info
Economic Value Info
Medical Info
General Site Distribution Country I
General Site Distribution Country II
General Site Distribution Country I
General Site Distribution Country II
General Site Distribution Country I
General Site Distribution Country II
Site Location (1)
Site Location (2)
Site Location (3)
Site Location (1)
Site Location (2)
Site Location (1)
Site Location (1)
Site Location (2)
Geographic Info
Climatological Info
Topography & Soil Info
Botanical Detatled Info
Economic Value Detailed Info
Geographic Info
Climatological Info
Topography & Soil Info
Botanical Detatled Info
Economic Value Detailed Info
Geographic Info
Climatological Info
Topography & Soil Info
Botanical Detatled Info
Economic Value Detailed Info
Geographic Info
Climatological Info
Topography & Soil Info
Botanical Detatled Info
Economic Value Detailed Info

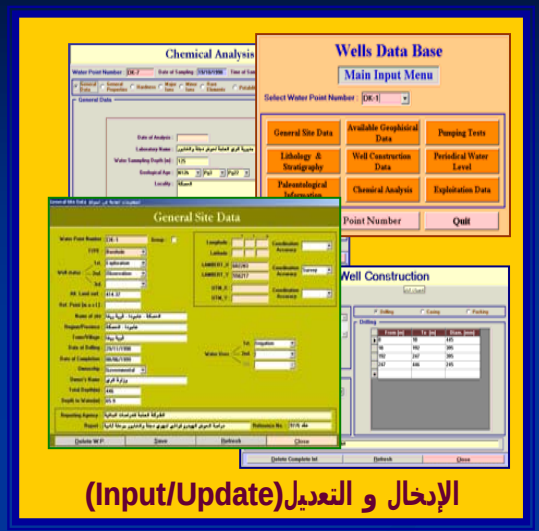
B- Arab Water Resources Data Base :

- **Since water in the Arab region is becoming scarce in quantity and inadequate in quality ,due mainly to the fact that the ever increasing demands persist to exceed the supply. ACSAD has launched a project for the establishment of an Interactive Regional Arab water resources data base . The project ,building on the achievement of the many previous endeavors ,focuses on assessing the developing situation regarding fresh water throughout the Arab region.**

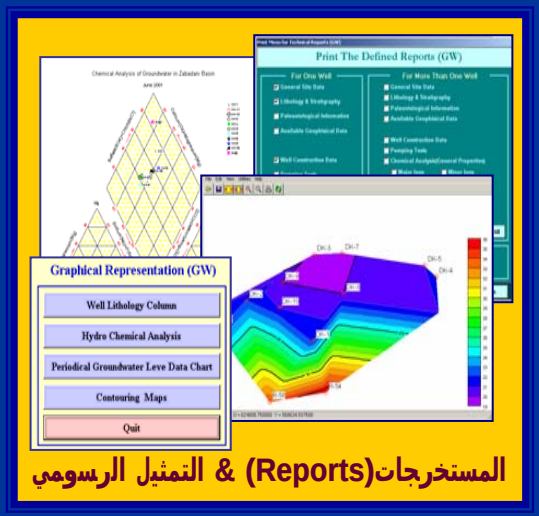
- The primary output is an interactive digital maps and data base . This interactive map shall comprise layers of topographic ,geological ,hydro-geological ,surface water bodies and wadis ,water use ,land use data ,etc. It shall be dynamic and can easily incorporate any new data into it . The data base is built within a GIS Arc info. environment , using ORACLE data base management system . The data base will include data compilation (geo-referenced meta-data bases) data interpretation comparative trend analyses ,data dissemination . A first proposal of the system has been presented last July 2004 ,during an expert group meeting held in ACSAD.

Data Base of Water resources (Oracle & VB)

حالة البئر (Status)



الإدخال و التعديل(Input/Update)



المستخرجات(Reports) & التمثيل الرسومي

Groundwater Data Base

GWDB V.1.0

Wells | Springs

New W.P. | Query

Input/Update | Reports

Status | Graphics

Quit

الوحدات الأساسية في البئر

الإستجواب (Query)

Flowchart of the Arab Water Resources Data Base

Main inputs

- General water budget
- Major springs
- Major lacs
- Major rivers internal - shared
- Internal-sharedground water basins
- Internal- Shared surface water basins
- General data
- National general data

Water studies

- Areas covered by water studies
- Type of study
- Contents of the study
- Scale of the Study

Land use

- Irrigated agriculture
- Rain fed agriculture
- Non cultivated lands
- Development indicators domestic,agricu ,lture ,Industry
- Development of Agriculture activities(Remot

Hydrogeological map

- Geology
- Groundwater basins
- Ground water table
- Renewable and non-renewable
- Exploitation indices
- Water quality
- Pollution indicators
- Environmental isotopes
- Major springs
- Areas with high salinity
- Borehole locations

Hydrographicdivisions

- Hydrologicalnetwork
- Hydrological stations
- Climatic stations
- Dams
- Pollution indicatores
- Water quality
- Rainfall distribution
- Water inflow/basin
- Spring locations
- Water use ,present ,future

Topographic map

- Topograph ic contours
- Roads
- Urban centers
- Rivers
- wadis
- Internation al borders

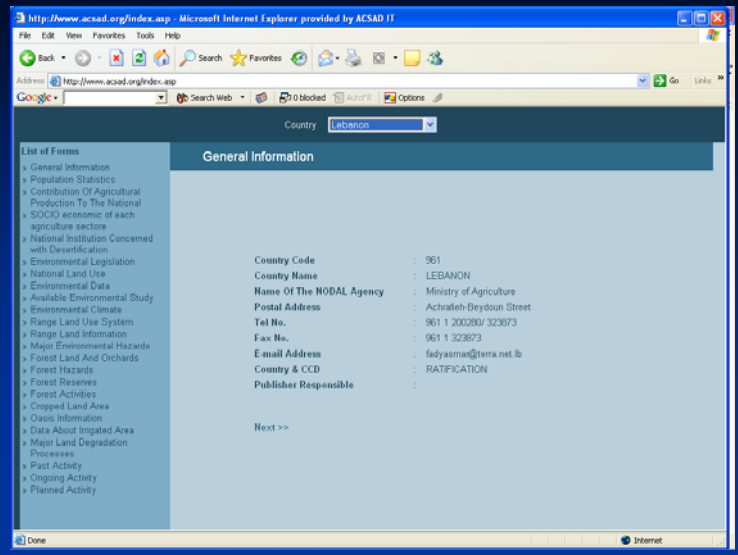
Digital base maps

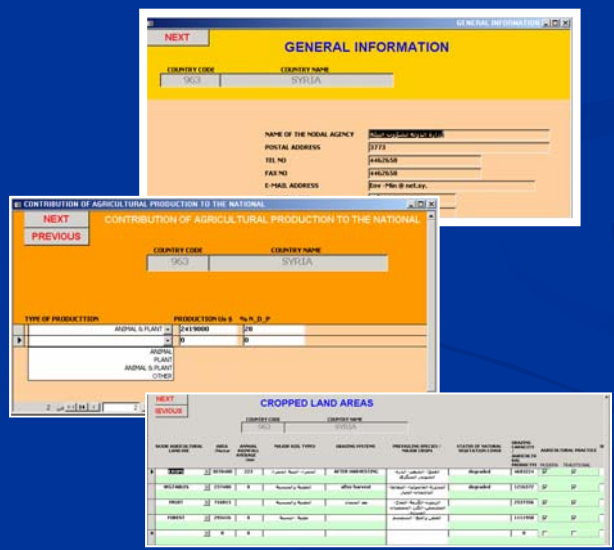
- Sheets and related data bases
- References

- Zones of recharge and discharge(atural/artificial
- Promised areas/at risks
- Nonconventional water resources
- Water budget / basin level

C- Regional data base on Sustainable Vegetation Cover Management in West Asia TN 2 :

- **This data base has been established within the framework of the Sub –regional Programme (SRAP) to combat desertification and drought in West Asia , realized in collaboration with ACSAD , UNEP –ROWA ,UNCCD and GM/UNCCD .This activity known as TN2 has the objective to carry out an inventory and establish a data base on sustainable vegetative cover management in West Asia , addressing the existing institutions , projects, personnel and outputs associated with status of vegetative cover in west Asia its use , degradation .**





http://www.acsad.org/SRAP/t1/T4.asp

- The data base established compile information on past ,on going and planned projects and activities ,including responsible institutions and organization involved ,location ,projects description and objectives ,contact persons ,results and eventually accessibility to the concerned people .

- ACSAD in collaboration with ICARDA has selected and developed the data base using ACCESS system and the Web site to serve the data base and link it to all the concerned countries through the focal points with a pass word for each country for facilitating the access to the data base and feed back This data base is now operational in ACSAD.

D- Regional data base on sustainable water management in West Asia TN1 :

- **This data base was developed as part of the Sub-Regional Action Program (SRAP) to combat desertification and implemented by ICARDA in cooperation with ACSAD. The objective is to develop an inventory and data base of past ,on going ,and planned activities relate to TN1 ,institutions and organizations working in water related projects , principal out puts ,and research and knowledge gaps as perceived by different stakeholders.**

- The project aims to provide a dynamic data base with information from member countries on water resources management activities accessible to all users .It allows all focal point members and stakeholders to use the database and utilize the information to develop and conduct activities within TN1 in West Asia .

E- Regional Thematic Network in Water Resources Management for Agriculture in Arid Semi Arid and Dry sub humid Area (TPN4)) :

- **The 1997 Beijing Ministerial Conference on Regional Cooperation in Asia decided on a framework to implement CCD in Asia . Six thematic programme Network areas that constitute the core structure of the Asian Regional Action Programme .were identified for promoting regional cooperation .One of these networks is the TPN4 which is coordinated by the Ministry of Irrigation in Syria .**
- **ACSAD is invited to be member of the steering committee of this network One of main objectives of the Network is to alleviate persistent lack of scientific data and information of arid regions relating to water resources management that severely impede an effective development of water management measures and policies. By gathering national stakeholders ,collect and improve the information networking within the countries involved ,this objectives could be achieved .**
- **This network has been launched 3 years ago but nothing concrete up to now is achieved .**

F- Long Term Ecological Monitoring Observatories Network in East Mediterranean ROSEEM .

- **In order to better understanding the desertification phenomena and act more effectively against its negative impacts ,ACSAD in cooperation with Sahara and Sahel Observatory (SSO) has launched a project for developing an observation ,monitoring and evaluation mechanism of the ecological system in East Mediterranean countries using remote sensing and GIS technique.**
- **The data collected (climatology ,Biodiversity ,hydrology , range land sand dunes movement) is stored in harmonized way to provide the manager or decision makers the accurate information regarding the process and evolution of desertification in the studied areas.**
- **Several meetings have been organized in ACSAd to define the objectives ,the structure and network operation .**
- **Un-fortunately this network could not be established ,due to lack of fund.**

G- Desertification Assessment and Monitoring System ;

- **ACSAD in cooperation with GTZ has launched a project for the establishment of a regional data base linked to GIS and building an early warning system for monitoring desertification in the Arab region .This system shall link all the remote sensing centers in the Arab region through a network to exchange information .This system is under preparation by ACSAD .**
- **A network of remote sensing centers in 4 countries; Syria , Lebanon , Egypt and ACSAD is already established .**

H- Wadi hydrology Network and Groundwater Protection Network :

- **Both networks have been initiated by ACSAD ,UNESCO ,Cairo office and ALECSO ACSAD is coordinating the wadi hydrology network which aims to generate and disseminate data and information regarding management of wadi systems in arid and semi arid zones in the Arab region .A data base has been established to include all the available information on the wadi systems in the Arab region .A website for the network has also been developed and hosted by ACSAD home page .**
- **The Groundwater Protection networks aims also to improve and disseminate information regarding the protection of groundwater in the Arab region .ACSAD is member of this network which is coordinated by the Institute of Groundwater Research in Egypt .**

Wadi Hydrology network

Web sit

http://www.acsad.org/wadi_hydr/WadiHydrology.htm

IV-Data and information availability (collectively, sectoral and thematic)

- The generation of data and information to the different data bases is ensured through the different projects and programmes implemented separately by ACSAD or in cooperation with other national or regional organizations . There is no unified data base or a core data set in ACSAD covering all the environmental information sectors. So the flow of data and information is directed to each specific data base ,water or soil or plants …..

- There is a need for a unified framework for the development of environmental information system. Such framework is needed to structure the collection ,analysis and presentation of environmental information and integrate environmental data on a geographic basis .This task is probably easy since the binding elements between all this data bases is that all related to a specific geographical location or area .
- Un-fortunately ACSAD does not has also a special sectoral monitoring programme to feed the different data bases .

V- Public Access :

- All the data ,information and reports generating by ACSAD activities are accessible to the interested public through direct contacts or ACSAD home page. The restriction imposed concerns only data and reports that have been produced through special contracts upon request from national concerned institutions in the Arab countries . All the available data and information including maps , printed materials are distributed free of charge to the interested persons ,researchers and university students .The access to the data bases is not permitted ,but ACSAD can provide all the data and information requested by means of hard copies , tables ,C.D, maps … etc .

- ACSAD is mandated to represent the league of the Arab states in all the international conventions ,such as desertification ,biodiversity and related issues .Un- fortunately ,the lack of structured approach to structure the collection , ,harmonization of environmental standards within the Arab countries ,analysis and presentation of environmental information, integrate environmental data on a geographic basis ,commitment of the countries to provide the necessary data and information ,constitute all a major constraints to meet the objective assigned to ACSAD to be the focal center for environmental information in the Arab region .
- The question of confidentiality of certain data released by the countries is also another obstacle for building integrated environmental information systems.
- Having some sort of conventions to organize the flow of information and data between ACSAD and the national institutions and regulating the exchange of information and the accessibility to public will be highly appreciated .

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

- The existing information systems are ,from the technical point of view ,very effective. It is possible not only to store data and information ,but also to produce, using GIS system, different thematic maps readily useable by planners and mangers.
- The strengths of the systems are that they can permit to have a good idea about the spatial distribution and evolution of different elements of the environmental system and produce a good assessment reports . The systems helps also to integrate and interlink the different environmental data and get a global over view on the environmental system.

The Weaknesses are;

- The capacity to ensure a continuous feed back for updating the data bases .
- Lack of a structure for integrating and hosting all the data bases in one environmental information system (at the national or regional level) and supervising the functioning of the system.
- Lack of a mechanism linking the regional data base (in ACSAD) to national data bases(including harmonization of environmental standards, compatibility of used soft wares in different countries …etc.)
- Lack of fund which affect negatively the sustainability of the system .
- Lack of awareness and perspectives about the utility to have a regional information system and the profit of the Arab countries from such system .
- Lack of commitments of the countries to cooperate and deliver the data and requested information.

VII- Constraints and barriers to manage and improve availability and accessibility of environmental data and information :

- The major constraints can be classified in two issues ;Technical and political .
- The technical constraints can be summarized as follows ;
- Lack of commitments of the national institutions to provide or facilitate the access to their own data and information systems .
- Lack of reliable data or information mainly old data(Pb.of continuity) .
- Lack of harmonization of environmental standards and indicators according to prevailing global guidelines .
- Inadequacies and consistency of available environmental data and information
- The environmental information is dispersed within different national institutions . In-existence of a central service ,at the national level which coordinates and handles the environmental information .
- Lack of an adequate mechanism for coordinating activities under taken at the regional level and in close cooperation with national institutions .
- Un-adequate monitoring system at national and regional level .
- Lack of fund to provide the necessary equipments ,organizing and maintaining a network for collecting and updating data and information and a hosted structure for processing, analyze and disseminate of data and information .
- Lack of well skilled people in IT or different environmental issues

The political constraints can be summarized as follows ;

- Deliverance of data and information is still considered, by some decision makers in the Arab countries as confidential and accessibility is restricted .
- The environmental issue is still considered in some countries as a luxury ,so no funds or legal support are allocated to build any environmental information system or even a monitoring system for different environmental elements .
- The dispersal of services assigned to deal with environmental issue and lack of coordination .

VIII -Environmental priority issue :

- The environmental priority issues in the Arab region are ,freshwater degradation in quantity and quality , water pollution, land cover degradation desertification , soil degradation and salinization ,biodiversity, urbanization coastal environment and industrial pollution .

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

- The environmental information needs of various group of users can be classified as follows ;
- For stakeholders :Their needs can be summarized as follows;
- Existence of a service or environmental body which can provide stakeholders with the information and advices to assist them to get best benefit and ensure sustainable use of natural resources (water availability, water quality ,soil characteristics …. Etc).
- Easy access to the environmental information .
- Provide them with the environmental information they need in a simple and useful form and ready to use .
- Improve public awareness about the existing and available of different environmental information systems ,where and how to access to the required information .

For decision makers : their needs can be summarized as follows ;

- Facilitating information flow between different actors.
- The existence of an integrated and flexible environmental information system .
- Presenting the environmental information in an understandable fashion to assist them in taking their decision.
- Have a trend about the past and future vision about the evolution of the different elements of the environmental system using a specific indicators .
- Provide models linking environmental processes and human- environment interactions.

X -Lessons learned and experiences :

- The importance to have a reliable data and monitoring system is a prerequisite to have a good and effective information system .
- The necessity to have a reliable body for organizing and managing the
- information systems .
- The necessity to promote communication and information exchange between different concerned parties ,decision makers ,stakeholders ,national institutions .
- The necessity to create a good funding system as a guarantee for the sustainability of the system .
- The necessity to harmonize environmental standards in different environmental sectors , format ,compatibility of data and systems used .
- The importance to have the commitments of national and regional institutions for cooperating and providing and exchange the data and information without restrictions .
- The necessity to involve ,stakeholders ,decision makers ,planners in the planning phase of the system .
- The importance to include the socio-economic issue in the system .
- There is a need to develop a plan for the harmonization process of , data system , information system ,data analysis and to select related indicators .

XI- Regional and international cooperation (including UNEP and other UN agencies):

Mutual cooperation between ACSAD and other regional organizations like , AOAD ICARDA , ESCWA ,UNESCO and UNEP is strongly recommended .A good example of mutual cooperation is the work which has been done between ACSAD and UNEP for the preparation of GEO -3 ,and also within the implementation of sun-regional activities of the UNCCD .Another example is on going activities between UNESCO and ACSAD for the preparation of a digital water resources map of the Arab world ACSAD will welcome any cooperation with UNEP for making use of their existing information systems .The cooperation between ACSAD and ICARDA for the implementation of SRAP programmes is also a good example .

XII- Opportunities for the future :

- Maintaining the environmental information systems in ACSAD and even build a new integrated one depend strongly on the support coming from regional and international programmes ,which provide not only the funds but also the arguments for maintaining and up- dating and making the systems more effectiveness . Such programmes will also help in maintaining the flow of data generating by various projects and activities conducted in or outside the region..

XIII- Recommendations of priorities for action:

1-Policy :

- With the emerging boom of the Media and the increasing in education level of the populations in most of the countries of the Arab region , the public became more aware about the different environmental aspects .The public became also more exigent about his rights to have good environment and request to be more involved in policy discussion and decision making .Such involvement necessitate that the accessibility to the environmental information must be facilitated .

-Consequently the national policy should be changed regarding the restrictions on the exchange of information at the national and regional level .It is evident that, there is also a need to adopt some regulations regarding this issue .It is not possible to take out all the restrictions by for example , separating the information in two types ,one which request a special authorization (because in some cases the deliverance of some information could create a trouble in the country) and the second one without .There is also a need to enforce the exchange of information at the regional level .

-A commitment of each country of the region regarding this issue is necessary .This will help in getting a regional overview on the environment which will be of profit for all the countries of the region

-There is a need to adopt an open policy regarding the free exchange of data and information at the national and regional level .The environmental information should not no more be considered by politician and decision makers as confidential with restricted distribution .The future concerns all the people of the region , so the free circulation of environmental information at all levels, should be encouraged .

-In this case there should be a legislation that organize all the issue related to the environmental information system, collection ,processing ,integration, uses of all environmental data bases and accessibility of the public to the environmental information system. At the regional level there should be an agreements and convention signed between the countries and regional organization that organize and guaranty the sustainability of the flow and exchange of data and information and regulate the accessibility to the environmental information system .

2-Institutional:

-Since the environment concern different national institutions ,this situation implies that the environmental information are in most of the cases dispersed between different services .The creation of a strong structure at the national level which will be assigned to take in charge the responsibility to harmonize standards ,data bases ,guidelines to collect and validate the data and information and finally coordinate actions .

-The existence of such body will also help in resolving conflicts between various national services and in the same time accelerate the coordination and exchange of information at the regional level by arranging some agreements that facilitate contacts, coordination and flow of environmental information.

- The guaranty of the sustainability of a regional environmental information system is depending on the existence, at the national level, of a proper institutional arrangement with appropriate funds, that handle the national environmental information system and ensure the coordination and integration among national services working or generating environmental information .
- The establishment of a regional environmental information system network through the creation of internet site, linking these national institutions with regional and international organizations or initiatives concerned by the environmental issues can be considered a good arrangement .Such network should be managed by a regional organization which has the technical and institutional capacity and accessibility to funds .

3-Technical ;

- An arrangement should be undertaken between the national leading agencies and regional concerned organizations , for harmonizing environmental standards , guidelines , indicators , compatibility of different data bases systems used
- (hard ware ,software) at the national and regional level ,type of outputs, data to be exchanged …etc .
- A continuous training programme should also be maintained gathering the persons concerned by the environmental information system at national and regional level .Such programme will permit them not only to upgrade their knowledge but also to have the same vision of the system and to speak the same technical language. Such programme will help in accelerating the establishment of the regional system and in the same time ensure the flow and exchange of information .

-A good management of the environmental information system requires a well skilled and trained staff at the central structure, able to deal with up to date technology and software .They will take in charge the organization of the work ,arrange links between different existing data bases and monitoring systems at the national and regional levels .They have to set up standards and other technical issues to facilitate ,exchange of data and information and ways of communications and connections with regional data bases through internet ,networks …etc.

-A bi- annually meetings should be arranged between technical staff at the national and regional to coordinate and standardize the collection of data and information ,looking to the compatibility of different systems used and to discus ways and means to accelerate exchange of data and communications .Such meetings will help also in creating confidence and friendly relationship between the national and regional technical staff .

4-Financial :

- This is a key issue for sustaining the system .Funds is necessary for maintaining the cooperation among the concerned institutions at the national and regional levels and consequently the regional network ,to seek up to date or up-grading the available technical materials ,holding continuous capacity building programmes ,organizing periodical regional meetings between different actors in the system for maintaining the dialogue and the contacts among them .

- From our experience in the region without such meetings the progress in achieving the tasks will not succeed .Generally speaking the national funds are always limited and if we want the success in implementing the environmental information system in the region adequate funds should be ensured for unless 5 years or even more.

5-Sustainability ;

- As mentioned previously the key factors ensuring the sustainability of the environmental information systems are the following ;
- The creation of a leading institution at the national level which manage the system in all its steps and integrate the data from different actors , (monitoring . collection ,processing , dissemination … etc.).
- Good awareness of decision makers about the importance of establishing and maintaining environmental information system.
- The existence of a regulation that organize the collection and flow of information, accessibility of the public, exchange and flow of information with regional organizations or nearby countries .
- Providing sufficient funds for maintaining the national and regional system as described before .
- The presence of well skilled and enthusiastic staff for the management of the system.
- Support of international funding agencies and Global programmes ,such as ,UNCCD ,Global climate change ,Biodiversity …..
- Holding frequent regional meetings and workshops in view to encourage the national staff from different nearby countries and regional concerned organization to cooperate and exchange experience and know how .

Thanks For Your Kind Attention