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Regional Study
Abu Dhabi Global Environmental Data Initiative

AGU Report

By

Mohammed Ait Belaid

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Table of contents

TASK-1

Please answer the following questions:

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

- Groundwater Modeling and Management of Water Resources.
- Protected and soil-less Agriculture Technology.
- Modern Technologies for Monitoring Desertification (GIS/RS).
- Soil Salinity, Water Logging and Soil Erosion.
- Urbanization and Land Use Planning.
- Coastal Zone Management and Development of Marine Resources.
- Integrated Environmental Assessment.

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

- Basic Environmental Data Accessible to the Users.
- Regular Environmental Reporting and Outlook.
- Set-up and Adoption of Environmental Indicators to follow-up the main environmental 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?

- GEO process is dealing with the presentation of a comprehensive reviews and analyses of world wide environmental conditions, trends and the policies. It is a continuous process initiated by UNEP: Started in 1997 (GEO-1), 2000 (GEO-2), 2002 (GEO3), 2003 (GEO Year Book) and the coming (GEO-4).
- GEO Data Portal established by UNEP.

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

- Data not structured.
- Data not Accessible to the users.
- Data Standards not existing.
- Data Cost to be funded.

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

- Internet/ E-mail.
- CD-Rom.
- Printed Materials (Reports, Hardcopy).

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

- Data Copyright belong to the Departments, which create and up-date data.
- Concept of Data Sharing is not applicable.
- " Data/information is power ".
- Limited Publication.

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

- Priority Environmental Indicators in West Asia, Arab Africa Regions. This study has been conducted recently and jointly by UNEP and AGU (Asma et al., 2004). The thematic areas covered are Water, Energy, Health, Agriculture (and Land), Biodiversity, Coastal and Marine Environment.

Are there any monitoring programmes (national or regional) aiming at collecting data and filling in data gaps, what are the thematic areas covered?

- FAOSTAT Database initiated and Managed by UN/FAO in order to produce Land Use/ Land Cover Maps both at national and global levels.
- GEO Reporting Process initiated by UNEP to cover the following fields: Socio-economy, Land, Freshwater, Forests, Biodiversity, Marine and coastal areas, Atmosphere, Urban areas.
- Actual AGEDI initiative to provide cost-effective access to environmental data to both developed and developing countries.
- Millennium Ecosystem Assessment initiated by United Nations.

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?

- State Of Environment (Arab GEO)
- Global Environmental Outlook (GEO including West Asia).

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).

- Access to environmental data to be facilitated by the Departments, which are in charge of different activities (Agriculture, environment).
- Set-up regulations on copyright and use of environmental data.
- Capacity building and awareness in data handling and analysis.

TASK-2

Name: Global Environmental Outlook (GEO) Series of Reports for Western Asia Region.

1. Lead agency: UNEP.

2. Purpose, aims, objectives: presentation of a comprehensive reviews and analyses of world wide environmental conditions, trends and the policies available to address them.

3. Users: UN Organizations, International & Regional institutions, Governments, NGOs.

4. Methods - a description of the work done: Participatory review and assessment of global and regional environmental issues (conditions, trends, policies).

5. Appropriateness of the approach: Appropriate

6. Institutional capacity: Workshop Training on the GEO Process, Environmental GIS/RS Applications.

7. Outcomes and benefits achieved: GEO Report series (GEO-1, GEO-2, GEO-3, GEO Year Book 2003, Arab GEO).

8. Results (impact): environmental data and information on the form of a database (CD-Rom, Web Portal).

9. Effectiveness and efficiency: effective in disseminating information and data to the users and decision-makers.

10. Discussion on the results in relation to the intensions: there is high conformity between results and intentions.

11. Lessons learned and experiences: Environmental assessment and reporting, database building, retrospective and prospective analyses and scenarios.

12. **Name: Impact of Climate Change in the Kingdom of Bahrain.**

13. Lead agency: General Commission for the Protection of Marine Resources, Environment and Wildlife. (Former Ministry of Housing, Municipalities and Environment).

14. Purpose, aims, objectives: Enabling activities for the preparation of initial national communication related to the United-Nations Framework Convention on Climate Change (UNFCCC).
15. Users: UNEP, General Commission, Governmental institutions, NGOs.

16. Methods - a description of the work done: The study was carried out by a national team from the General Commission of Bahrain, under the supervision of two faculty

members from AGU. The study is composed of four components: Inventory, Mitigation, Vulnerability and Adaptation using IPCC (Inter-Governmental Panel on Climate Change) methodologies.

17. Appropriateness of the approach: the approach based on the diagnosis of the existing documents and fieldwork is appropriate.

18. Institutional capacity: General Commission will benefit through the study team and AGU will benefit also as a main consultant for the whole project.

19. Outcomes and benefits achieved: Study of the main component based on the existing documents, satellite imagery and field works. Reports are in compliance with UNFCCC.

20. Results (impact): Series of reports and maps covering each component.

21. Effectiveness and efficiency: Effective for future UNFCCC.

22. Discussion on the results in relation to the intensions: The results are encouraging.

23. Lessons learned and experiences: Inventory and mitigation of greenhouse gas emissions, vulnerability and adaptation to sea level rise, flow of data and information.

Name: Status of Coral Reefs in the Kingdom of Bahrain. واقع الشعاب المرجانية في المياه الإقليمية لمملكة البحرين

24. Lead agency: General Commission for the Protection of Marine Resources, Environment and Wildlife.

25. Purpose, aims and objectives: Studying the status of coral reefs in the Kingdom of Bahrain.

26. Users: pearl divers, fishermen, Ministries of Environment, Fishery and Industry.

27. Methods - a description of the work done: Review of the existing background documentation, digitizing of the existing maps and production of the report on the degradation of coral reefs with some possible solutions.

28. Appropriateness of the approach: the approach based on the diagnosis of the existing documents is appropriate.

29. Institutional capacity: the study will be the start-up of new developments in the fields of coral reefs.

30. Outcomes and benefits achieved: Status of the art based on the existing studies.

31. Results (impact): Mapping and Inventory of coral reefs.

32. Effectiveness and efficiency: Effective for future protection and management of coral reefs.

33. Discussion on the results in relation to the intensions: The results are encouraging.

34. Lessons learned and experiences: Bibliography, acquisition of documents and maps, investigation of the status of coral reefs, main causes of degradation, proposition of possible solutions for the management of coral reefs.

Name: Atlas of Desert Habitats in the Gulf Cooperation Council (GCC) Countries. أطلس البيئات الصحراوية في دول مجلس التعاون الخليجي.

35. Lead agency: GCC Countries.

36. Purpose, aims, objectives: Preliminary study to establish an Atlas of desert habitats in the GCC countries, which will provide information on natural resources, biodiversity, climate and population.

37. Users: Environmental institutions in the GCC Countries, education institutions.

38. Methods - a description of the work done: The conceptual study covers the following areas: inventory of the existing data, type of media, timetable and estimated costs.

39. Appropriateness of the approach: the approach based on the diagnosis of the existing data is appropriate.

40. Institutional capacity: the study will be the start-up of a comprehensive study, which will be conducted in order to elaborate the proposed Atlas.

41. Outcomes and benefits achieved: Status of the art based on the existing studies.

42. Results (impact): Inventory of natural resources and socio-physical conditions in desert environment.

43. Effectiveness and efficiency: Effective as a feasibility study in order to evaluate the whole process of producing the Atlas (data, time, cost).

44. Discussion on the results in relation to the intensions: The results are encouraging.

45. Lessons learned and experiences: Inventory and classification of natural resources, conceptual model elaboration.

Name: Building International Database for GCC Countries.

46. Lead agency: Arabian Gulf University (AGU).

47. Purpose, aims, objectives: To collect, digitize and compile all available GCC countries maps through student's studies, thesis and projects to end up with a digital database for GCC countries.

48. Users: AGU Staff Members and Students.

49. Methods - a description of the work done: Data collection, Digitizing, Editing and compiling the data.

50. Appropriateness of the approach: the approach based on the compilation of the data provided by countries and the results of research projects is appropriate.

51. Institutional capacity: Data gathering, database building.

52. Outcomes and benefits achieved: Map of GCC countries, status of the realized studies.

53. Results (impact): Internal database.

54. Effectiveness and efficiency: Effective as a pilot study for database design.

55. Discussion on the results in relation to the intensions: The results are encouraging.

56. Lessons learned and experiences: Structuring and Designing Databases using GIS layers and Remote Sensing imagery.

Name: Priority Environmental Indicators in West Asia, Arab Africa Regions.

57. Lead agency: UNEP.

58. Purpose, aims and objectives:This study aims at Providing guidelines for development and utilization of environmental indicators. A core set of priority environmental indicators addressing some priority themes in the region will be presented: freshwater resources, land resources, coastal and marine resources, energy, biodiversity, health and environment.

59. Users: UNEP, Countries of the Regions, Regional Institutions.

60. Methods - a description of the work done: Methodology sheets have been developed for each selected indicator.

61. Appropriateness of the approach:

62. Institutional capacity: Selection and Definition of Environmental Indicators.

63. Outcomes and benefits ~~expected or~~ achieved: A Set of Environmental Indicators.

64. Results (impact): Environmental Indicators to be adopted and used via some adjustment by the users.

65. Effectiveness and efficiency: Effective as a pilot study for Environmental Indicators Definition.

66. Discussion on the results in relation to the intensions: The results are not tested yet.

67. Lessons learned and experiences: Designing a set of standard Environmental Indicators to answer the needs of countries and institutions.

TASK-3

1- Title:

AGEDI Regional Study: Report on AGU Experience on Environmental Data.

2-Executive summary

The objective of the study is to collect information and prepare national and regional reports on the experiences, best practices and status of environmental data and information systems in West Asia. The information produced will be integrated into a regional report, which will in turn be integrated with a global report to be used in guiding the development and implementation of AGEDI. It would also be used to develop a regional strategy for environmental information in West Asia.

It also aims at establishing a base for regional partnership and networking for environmental data and information, using the experts and the institutions involved in the study as a pool of resources to strengthen and build the capacity of the region in data and information management in support of decision making bearing on sustainable development.

As a Regional organization, AGU has adopted a methodology which consist in reviewing and assessing environmental data and information and providing information on the institution experience both internally and within the regional and global framework.

In West-Asia, there is a general lack of reliable up-to-date information and data on the state of the environment. This relates to the lack of standardization of data formats and consistent environmental monitoring, data collection and reporting (GEO-2000, 2000).

3- Introduction and background

The Arabian Gulf University (AGU) was established in 1980 by the six gulf countries (Bahrain, Kuwait, Oman, Saudi Arabia, and UAE) as a regional, non-political, non-profit making institute that aspired to fulfill the developmental, educational and cultural needs of the region.

AGU is composed of two Colleges of Medicine and Graduate Studies, which are in turn composed of many programmes. Some of them are dealing with various environmental issues.

The College of Graduate Studies including the Sphere of Technology and Special Education and a supporting unit of Geographic Information Systems and Remote Sensing (GIS/RS) is composed of the following programmes:

- Desert and Arid Zones Sciences (Water Resources, Desert Agriculture, Desert Environment).
- Biotechnology (Agriculture, Environment, Medicine).
- Technology Management.
- Environmental Management.
- Distance Learning.
- Mental Retardation and Learning Disabilities.
- Talented and Gifted Children.

The College of Medicine and Medical Studies is composed of other programmes: Undergraduate Medical, Bachelor in Professional Skills and in Community Health, Master in Health Professions Education, in Laboratory Medicine, and in Policy and Population Studies.

More than 120 theses were completed under the sphere of technological studies, out of which more 70% theses dealt with environmental problems. The research projects covered various scientific areas of interest to the region, i.e. desert resources, resources management, desert architecture and energy, pollution control, biotechnology studies and recently GIS and RS related applications.

AGU, considered as the principal regional center of postgraduate studies, has given environmental issues a sizable role in its educational, training and research programmes. AGU is running courses and organizing programmes, and postgraduate studies in different fields of the environment especially in desert and arid zones sciences, environmental biotechnology, health and recently in environmental management.

AGU has established five academic chairs to support research and development activities; most of them are related to environmental issues:

- Chair of Environmental Sciences (Sheikh Zayed).
- Chair of Desert Agriculture (Sultan Qaboos).
- Chair of Biotechnology (King Fahad).
- Chair of Geographical Information Systems (Sheikh Hamad).
- Chair of Technology Management (Sheikh Essa).
- Chair of Clinical Microbiology and Immunology (Sheikh Jaber).

4-Methodological approach.

As a Regional organization, AGU has adopted a methodology which consist in reviewing and assessing environmental data and information and providing information on AGU experience both internally and within the regional and global framework.

5-Status of environmental data and information.

AGU has a well-established tradition of serving as a collaborating center of excellence and between university, governmental agencies and international and regional organizations. Within this framework, AGU has realized some interesting projects and produced some environmental data and information (e.g. GEO reporting process, climate change study, coral reefs study, atlas of desert habitats, internal database).

a. Analysis of existing initiatives and projects.

Global Environmental Outlook (GEO): Environmental Reporting in West Asia Region.

UNEP started a comprehensive assessment process known as the Global Environment Outlook (GEO). The GEO reports are produced using a regional and participatory approach. Input is solicited from a wide range of sources throughout the world, including a network of more than 30 collaborating centers, UN organizations and independent experts. Draft chapters are reviewed in regional consultations. GEO-1 the first report in the GEO series was published in 1997. The second report GEO-2000 was published in 1999. The report is assessing the impact of current environmental policies and looking for new perspectives. GEO-3 the third report was published in 2002. This report is based on retrospective (30

years) and prospective (30 years) analyses and scenarios. GEO Year Book 2003 is the fist annual report published in 2004.

AGU and the Arab Center for the Studies of Arid Zones and Drylands (ACSAD) are among the collaborating centers working in cooperation with UNEP in preparing the GEO report series particularly for Western-Asia Region. Furthermore, AGU has participated in the preparation of the following GEO reports: GEO-1, GEO-2, GEO-3, GEO Year Book 2003 (UNEP, 2003), Arab GEO (Regional state of the environment for Arab countries expanding the West Asia section of GEO-2).

Impact of Climate Change in Bahrain: GHGs, Mitigation, Vulnerability and Adaptation.

The purpose of the project is to enable activities for the preparation of initial national communication related to the United Nations Framework Convention on Climate Change (UNFCCC). The study was carried out by a national team from the former Ministry of Housing, Municipalities and the Environment of Bahrain, under the supervision of two faculty members of the sphere of technological studies of AGU. The study is composed of four successive steps with the corresponding reports:

- Bahrain Inventory of Greenhouse Gas Emissions (MHME/AGU, 2001).
- Greenhouse Gas Mitigation in Bahrain (MHME/AGU, 2001).
- Vulnerability Assessment (GCPMREW/AGU, 2003).
- Adaptation Measures (GCPMREW/AGU, 2004).

AGU is the main consultant for the four components of the project. Data were collected from government and private reports, field works and satellite imagery and then were analyzed. The reports were prepared and a flow of environmental data and information were accumulated for each component mostly in digital and electronic format.

Status of Coral Reefs in the Kingdom of Bahrain.

This study has been ordered by the General Commission of Bahrain (GCPMREW) and realized by a team from AGU. This study aims at providing the status of coral reefs in the kingdom of Bahrain. The adopted methodology is based on the Review of the existing documents, digitizing of the existing maps and production of the report, emphasizing on the status of coral reefs, the causes of degradation, and proposition of possible solutions for the management of coral reefs.

Atlas of Desert Habitats for the Gulf Cooperation Council (GCC) Countries.

A preliminary study was conducted, in order to prepare an Atlas for desert habitats at the level of GCC countries. This Atlas will provide valuable information on natural resources in addition to biodiversity, climate and population. The conceptual study covered the following four areas: inventory of the existing data, type of media, timetable and estimated costs. A comprehensive study will be conducted in order to elaborate the proposed Atlas, based on RS data and GIS techniques (Ait Belaid et al., 2002).

Building Internal Databases for GCC Countries.

This activity was undertaken recently, in order to prepare and produce an internal database with base maps (provided by countries), as a first step, for GCC countries containing many layers of information: administrative boundaries, roads and cities. This database will include

also the results of research projects. It will incorporate also the archive of satellite imagery. This will facilitate the task for students and faculty members to conduct their research and also for the purpose of project development and management (Ait Belaid et al., 2002).

b. Data and information availability (collectively, sectoral and thematic)

Concerning the project on the impact of climate change, data were collected from government and private reports with field works and satellite imagery and then were analyzed. The reports were prepared and a flow of environmental data and information were accumulated for each component mostly in digital and electronic format.

The research activities granted by several organizations and carried out at AGU or outside by AGU faculty were compiled in technical reports. Most of them are dealing with environmental issues (refer to the list of granted projects in paragraph 5.e below).

More than 120 theses were completed under the sphere of technological studies, out of which more 70% theses dealt with environmental problems. These theses are available at the sphere of the technological studies and can be used by our graduate students, faculty members and can also consulted by the public.

c. Public Access.

More than 120 theses are available at the sphere of the technological studies and can be consulted by our graduate students, faculty members and they are also accessible to the public in general in hardcopy.

The results of the all other projects are produced in the form of technical documents/ reports in hardcopy format and sometime in digital format. All these reports are given to the lead agencies, which have the copyright. So, In many cases the data used and the information derived are not accessible to the general public.

d. Information policy and legislations.

Presently, there is no formal information policy and written legislations within AGU departments nor between GCC institutions and countries. All data and information related to the projects conducted at AGU are transferred immediately to the lead agencies. The results of the research may be published jointly by AGU staff members and the team of the project from other regional and international institutions.

e. Institutional capacity for managing environmental data and information.

AGU has conducted a series of training workshops related to environmental issues in collaboration with UNEP, UNESCO and ALECSO (Groundwater Hydrology, scenarios development, assessment and reporting, state of environment) as well as GIS/RS applications for environment:

- Microcomputer Applications in Groundwater Hydrology and Pollution (May/June, 2000).
- West Asia Regional Training Workshop on Integrated Environmental Assessment and Reporting (January, 2001).
- The Regional GEO-3 Consultation Meeting for West Asia (June, 2001).

- Regional Workshop on Integrated Environmental Assessment and Reporting (January, 2003).
- Introduction to Geographical Information Systems (January, 2003; Marsh, 2003; September, 2003).
- Applications of Geographical Information Systems for Soil Survey (December, 2003).
- Innovatory Methodologies for Satellite Image Processing and Analysis (September, 2002; October, 2003; October, 2004).
- Land Use Change Detection and Analysis (September, 2004).
- Regional Stakeholders Roundtable in Preparation for the World Summit on Sustainable Development WSSD (September, 2001).
- Arab Region Millennium Ecosystem Assessment (September/October, 2003).
- Expert/ Consultation Meeting on the Development of West Asia Web Portal (April, 2002).

Other activities include offering seminars, by AGU staff members and/or invited distinguished scientists, organizing and sponsoring training courses, workshops, symposia and conferences (e.g. Symposium on Desertification and Land Reclamation in the GCC Region in 1993, International Conferences GIS-1998, GIS-2002, GIS-2004) on issues of top priorities.

f. Financing of environmental data and information.

The financing of environmental data and information is supported mainly by UNEP for GEO process, for the impact of climate change (UNFCCC) and also for the study on environmental indicators. The other two projects (Coral reefs in the Kingdom of Bahrain, Atlas for desert habitats) are respectively funded by the general Commission of Bahrain (GCPMREW) and the Secretariat of GCC Countries. The financing of the remaining initiative related to building internal database is ensured by AGU support. In general, it is difficult to ensure funds for environmental development projects, particularly for the countries of the region, which are considered to have a high income. So they have to ensure their proper funds for these purposes.

Throughout the intensive research activities of AGU, some of their research projects were sponsored by grants or other supportive measures, particularly during the period of 1990-2000. In the following, the supported projects are listed:

- National Action Plan to Combat Desertification (NAPCD) respectively in the countries of Bahrain, United Arab Emirates and Sultanate of Oman; supported by UNEP/ROWA/ESCWA (1992-93).
- Water Resources and Pollution, Hazardous wastes, air pollution, recycling of waste supported mainly by the Bahrain Center for Studies and Research (BCSR).
- Rapid Assessment of Impacts of Ira-Kuwait Conflict on Terrestrial Ecosystems in Kuwait, Saudi Arabia and Iraq, supported by UNEP (1991).

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

The actual approach “information system” adopted by the sphere of technological studies for data gathering, analyzing, structuring (database), storing, publishing is effective to answer the proper needs of AGU partners, students and staff, but it is inaccessible legally and useless by the general public.

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

Some of the constraints to manage and improve availability and accessibility of environmental data and information are related mainly to the structuring, storing and retrieval of data.

8-Assessment of general requirements:

This section deals with the assessment of general requirements to be fulfilled by environmental data and information.

g. Environmental priority issues.

- Groundwater Modeling and Management of Water Resources.
- Protected and soil-less Agriculture Technology.
- Modern Technologies for Monitoring Desertification (GIS/RS).
- Soil Salinity, Water Logging and Soil Erosion.
- Urbanization and Land Use Planning.
- Coastal Zone Management and Development of Marine Resources.
- Integrated Environmental Assessment.

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

- Basic Environmental Data to be Accessible to the wide range of Users.
- Regular Environmental Reporting and Outlook to be conducted by governments/countries.
- Set-up and Adoption/Agreement of Environmental Indicators to follow-up systematically the main environmental Issues.

i. Technological needs

In order to be easily accessible, data and information need to fulfill the following requirements:

- Structured and designed as regular databases with data dictionary and catalogue of meta-data, describing both the nature and the contents of the database.
- Stored in the appropriate media in the appropriate format on an appropriate server/computer, in order to facilitate the retrieval of data using the meta-data catalogue.
- Have the specific software available to display and manipulate different types of data and information (e.g. satellite imagery, GIS layer/coverage).

j. Institutional needs (including training and finance)

Institutional needs may be subdivided mainly in two groups: training and finance:

- Training is needed in the fields of data gathering, data analysis and storage, database design.

- Financing are also needed to conduct pilot studies related to software manipulation and acquisition, data storage, database building. As highlighted in paragraph 5-f, financing is a big concern; because the countries of the region are considered to have a high income relatively.

9- Regional and international cooperation.

AGU has a well-established tradition of serving as a collaborating center of excellence and know-how between university, governmental agencies and international and regional organizations such as: UNEP, UNDP, UNESCO, UNIDO, ESCWA, ISESCO, ALECSO, ACSAD, STEMARN.

AGU and the Arab Center for the Studies of Arid Zones and Drylands (ACSAD) are among the collaborating centers working in cooperation with UNEP in preparing the GEO report series particularly for Western-Asia Region.

AGU has conducted a series of training workshops related to environmental issues in collaboration with UNEP, UNESCO and ALECSO (Groundwater Hydrology, scenarios development, assessment and reporting, state of environment) as well as GIS/RS applications for environment.

10- Opportunities for the future.

In terms of perspective, there are some opportunities that may be targeted in the near future:

- Abu Dhabi Global Environmental Data Initiative (AGEDI).
- Center for Environmental Information and Assessment at AGU.
- Regional Web Portal for West Asia.
- Millennium Ecosystem Assessment initiated by United Nations.
- Space Techniques for Disaster Management initiated by the United Nations Office of Outer Space Affairs (OOSA).
- New Funded Projects on Environmental Issues.

11- Lessons learned and experiences.

The lessons learned and the experiences that AGU has achieved in the area of environment throughout its activities of training, research and public awareness can be summarized in the following points:

- Environmental assessment and reporting, database building, retrospective and prospective analyses and scenarios.
- Inventory and mitigation of greenhouse gas emissions, vulnerability and adaptation to sea level rise, flow of data and information.
- Investigation of the status of coral reefs, main causes of degradation, proposition of possible solutions for the management of coral reefs.
- Inventory and classification of natural resources in desert environment, conceptual model elaboration.
- Structuring and designing database using GIS layers and Remote Sensing imagery.
- Designing a set of standard environmental indicators to answer the needs of countries and institutions.

- Organization of a series of training workshops related to environmental issues as well as GIS/RS applications for environment, in order to build the capacity of AGU to deal with the management of environmental data.
- Elaboration of a series of Action Plan to Combat Desertification (NAPCD).
- Water Resources, Hazardous wastes, air pollution and recycling of waste.
- Rapid Assessment of Impacts of Conflict on Terrestrial Ecosystems.

12- Recommendations of priorities for action. Please consider the following:

k. Policy.

- Access to environmental data to be facilitated by the Departments, which are in charge of different activities (Agriculture, environment).

- Joint Publication and diffusion of the results of projects to be encouraged.

l. Institutional.

- Set-up regulations on copyright and use of environmental data and information.
- Training workshops and seminars to be conducted for capacity building (staff, institution).

m. Technical.

- Capacity building and awareness in data handling and data analysis.
- Data gathering, sharing and dissemination to be encouraged between AGU and other regional and international partners/institutions.

n. Financial.

- Environmental data and information cost to be funded.

o. Sustainability.

- Data an information standards to be defined, agreed on and adopted.
- Data archiving facilities to be provided.

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Appendix 1: List of Acronyms

ACSAD: Arab Center for the Studies of Arid Zones and Drylands.
AGEDI: Abu Dhabi Global Environmental Data Initiative.
AGU: Arabian Gulf University.
BCSR: Bahrain Center for Studies and Research.
ALECSO: Arab League Educational, Cultural and Scientific Organization.

DEWA: Division of Early Warning.
ESCWA: Economic and Social Commission for West Asia.
FAO: Food and Agriculture Organization of the United Nations.
FAOSTAT: Agricultural & Land Use Database established by FAO.
GCC: Gulf Cooperation Council.
GCPMREW: General Commission for the Protection of Marine Resources, Environment and Wildlife.
GEO: Global Environmental Outlook.
GHG: Greenhouse Gas.
GIS: Geographic Information Systems.
IPCC: Inter-Governmental Panel on Climate Change.
ISESCO: Islamic Educational, Scientific and Cultural Organization.
MA: Millennium Ecosystem Assessment.
MHME: Ministry of Housing, Municipalities and Environment.
NAPCD: National Action Plan to Combat Desertification.
NGO: Non-Governmental Organization.
OOSA: Office of Outer Space Affairs.
ROWA: Regional Office for West Asia.
RS: Remote Sensing.
SOE: State of Environment.
STEMARN: Science and Technology Management Arab Regional Network.
UAE: United Arab Emirates.
UNDP: United Nations Development Programme.
UNEP: United Nations Environment Programme.
UNESCO: United Nations Educational, Scientific and Cultural Organization.
UNFCCC: United Nations Framework Convention on Climate Change.
UNIDO: United Nations Industrial Development Organization.
WSSD: World Summit on Sustainable Development.