MEDITERRANEAN ACTION PLAN

First Presentation Meeting of the Fuka-Matrouh Coastal Area Management Programme

Matrouh, 18-19 September 1995

REPORT OF THE FIRST PRESENTATION MEETING OF THE FUKA-MATROUH COASTAL AREA MANAGEMENT PROGRAMME
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Introduction

1. In conformity with a decision by the Seventh Ordinary Meeting of the Contracting Parties (Cairo, October 1991), a Coastal Area Management Programme (CAMP) for the Fuka-Matrouh area was developed and an Agreement relative to the project was signed by the Government of Egypt and UNEP/MAP on 9 November 1992. The activities in the framework of this CAMP have been implemented since that date.

2. The first presentation meeting was organised by MAP, in cooperation with the Egyptian Environment Affairs Agency (EEAA), in Matrouh, on 18-19 September 1995, in order to:
   - present the results achieved so far on the on-going activities, and
   - conduct the necessary consultations with the Egyptian counterpart as well as between the various national, local and international consultants and experts of the various activities.

3. The list of participants is attached as Annex I and the Agenda of the meeting as Annex II to this report.

4. The meeting was conducted in English with a summary of the presentations in Arabic.

5. At the end of each presentation, questions were raised and answers were given by participants

Agenda Item 1- Opening of the meeting

6. The meeting was opened by Mr. Salah Hafez, Chief Executive Officer (EEAA). He welcomed the participants to the meeting and stressed the importance of the project for the Fuka-Matrouh area. He briefed the meeting on some of the activities being implemented by EEAA in relation to Coastal Zone management.

7. The meeting heard a welcome statement by Mr. Zahir Abdel Rabman, Governor of the Governorate of Matrouh. He outlined the main activities and projects being implemented in Matrouh Governorate. He expressed the readiness of his Governorate to continue its assistance, cooperation and coordination in the implementation of the various activities within the framework of the Fuka-Matrouh CAMP.
8. Mr. Ibrahim Dharat, Senior Programme Officer, MAP, welcomed the participants on behalf of the Executive Director of UNEP and the Coordinator of MAP, and expressed his gratitude to EEAA and the Governorate of Matrouh for hosting and organising the meeting. He pointed out that it is expected that all activities will be completed early in 1996 with a view to presenting the final results in a conference to be held in Matrouh around the middle of 1996.

9. Mr. S. Hafez (EEAA), Mr. M. Ayyad (University of Alexandria) and Mr. I. Trumbic (PAP/RAC) were elected unanimously as Chairman, Vice-Chairman and Rapporteur respectively. Mr. I. Dharat acted as the Technical Secretary of the Meeting.

**Agenda Item 2- Coastal Area Management Programme of MAP**

10. Mr. I. Dharat briefed the meeting on basic concepts, objectives and activities of the CAMP project for the Fuka-Matrouh area. The full statement is contained in Annex III to this report.

**Agenda Item 3- Presentation of activities carried out in the framework of the Fuka-Matrouh Coastal Area:**

**Agenda Item 3.1- Systemic and prospective analysis including development-environment scenario for the area (BP/RAC)**

11. Mr. A. Hoballah, Deputy Director of the Blue Plan/Regional Activity Centre (BP/RAC), and Mr. M. Ayyad, Mr. K. Fahmi and Mr. W. Gamaleldin (Consultants to BP/RAC) introduced this item, presenting structure, objectives and the results of this activity and pointed out the problems encountered.

They pointed out that three studies within the framework of this activity were completed, and a limited number of copies were distributed:

a. A framework for Accumulating Consequential Data and knowledge
   By: Mr. M. Ayyad - 1995

b. Systemic and Prospective Analysis for an Environmentally Friendly Management
   By: Mr. C.Aruoba - 1995
c. Framework on Environmental Problems and Management (will be completed soon)
   By: Mr. K. Fahmi

A fourth study is still being finalised. One of the main recommendations proposed within this activity is the need to establish a Matrouh database.

12. A short summary of this activity and copies of the transparencies used in the presentations are attached as Annex IV to this report.

Agenda item 3.2 - Implications of climatic changes in the Coastal Area of Fuka-Matrouh (MED Unit)

13. Mr. A. Fanos and Mr. N. El-Fishawi (Consultants to MED Unit) introduced this item, presenting the structure, objectives and results of this activity and pointed out problems encountered. The latest report relevant to the activity was distributed to all participants (doc: UNEP(OCA)/MED WG.97/2)

14. A short summary of the activity with a few recommendations and copies of transparencies used in the presentations are attached as Annex V to this report.

Agenda item 3.3 - Integrated planning and management study for the Coastal Area of Fuka-Matrouh (PAP/RAC)

Agenda item 3.3.1- Integrated planning and management study

Agenda item 3.3.2- Geographic Information System (GIS)

Agenda item 3.3.3- Carrying capacity assessment for tourism

15. Mr. I. Trumbic, Acting Director (PAP/RAC), Mr. S. Moustafa and Mr. S. El-Kaffas (Consultants to PAP/RAC) introduced this item. It was pointed out that on the basis of the work done so far, the preparation for an integrated planning and management study would commence immediately. It is envisaged that a synthesis of the study would be ready for comments by all actors before it is finalised in an integrated planning and management study, to be presented to the Egyptian authorities around the middle of 1996.
16. It was pointed out that the various training courses were conducted as well as providing the Egyptian counterpart with the necessary software, and a core basis of experts has been created in Matrouh.

It was recommended that there was a need to complete the GIS system and undertake the necessary analysis of data gathered as well as to prepare a tourism master plan for the Fuka-Matrouh area.

17. A short summary of these activities and copies of transparencies used in the presentations are attached as Annex VI to this report.

**Agenda Item 3.4- Development of environment legislations and institutional framework (MED Unit)**

18. Mr. M. El-Gindy and Mr. H. Lutfi (Consultants to MED Unit) introduced this item, presenting the structure, objectives and results of the activity and pointed out problems encountered. The study entitled "A Legal Study of Environmental Legislations relating to the Fuka-Matrouh Area Project" was distributed during the presentation. It was recommended that there is a need for MAP to organise a training seminar on environmental legislations directed to local actors under the direction of Matrouh authorities and in cooperation with EEAA.

19. A short summary of this activity and copy of the presentations are attached as Annex VII to this report.

**Agenda Item 3.5- Protection and management of Specially Protected Areas and Historic Sites (SPA/RAC)**

20. Mr. C. Rais, SPA/RAC expert and Mr. M. Ayyad (SPA Consultant) introduced this item, presenting the structure, objectives and results of the activity and pointed out problems encountered.

Four studies were undertaken and presented within the framework of this activity:

a. The Terrestrial Ecosystems of Fuka-Matrouh Area (Egypt)
   Status - protection and Management Measures
   By: Mohamed A. Ayyad - 1993

b. The Marine Ecosystems of Fuka-Matrouh Area (Egypt)
   Status of species and habitats
   By: Ali I. Beltagy - 1993
c. Marine Turtles Conservation in the Mediterranean - Marine Turtles in Egypt (Phase I)
Survey of the Mediterranean Coast between Alexandria and El-Salum
By: Max Kasparek - 1993

d. Cultural Heritage Sites of the North-Western Coastal of Egypt
By: Feisal A. Esmael - 1995

21. During the discussion that followed the presentations of the studies and in particular on the issue of historic sites, it was recommended by the meeting to "give more consideration to the historic sites, based on already achieved work by SPA, through the involvement of MAP's Network for Historic Sites located in the Atelier de Patrimoine, of Marseille"

22. A short summary of this activity and copy of the presentation are attached as Annex VIII to this report.

**Agenda item 3.6 - Soil erosion and desertification (PAP/RAC)**

23. Mr. I. Trumbic (PAP/RAC), Mr. F. Abdelkader, Mr. S. Carnicelli, Mr. S. Mustafa and Mr. S. El-Kaffas (Consultants to PAP/RAC) introduced this item, presenting the structure, objectives and results of the activity and pointed out problems encountered.

24. A short summary of this activity and copy of the presentation is attached as Annex IX to this report.

**Agenda item 3.7 - Water resources management study (PAP/RAC)**

25. Mr. I. Trumbic introduced very briefly this item during which he pointed out that little has been done in relation to this activity. However, this issue has been tackled by most of other activities within this project.

During the discussion on this issue, the meeting was of the opinion that this issue should be considered by PAP/RAC in more detail due to its importance to the region. The Director of PAP/RAC promised to do so.

26. A short summary of the presentation is attached as Annex X to this report.

**Agenda item 4 - Remote Sensing for assessment of natural resources (ERS/RAC)**

27. Mr. M. Raimondi, Director of ERS/RAC and Ms. S. Carnemolla, expert at ERS/RAC, introduced this activity, presenting the structure, objectives and results of the activity and pointed out problems encountered. Moreover, the Director of the ERS/RAC gave the participants a briefing on the structure, objectives and activities of the MAP remote sensing Centre of Palermo (Italy).
28. A document entitled "Assessment of Land Resources supported by Remote Sensing" was distributed during the presentation. The report identifies, in the study area, a system of land Units homogenous as for geomorphology, pedology and vegetation cover.

29. The Director of ERS/RAC expressed his willingness of extending the activities carried out by his Centre in the framework of this activity.

30. A short summary of this activity and copy of the presentations are attached as Annex XI to this report.

**Agenda item 5- Other business**

31. Mr. H.J. Regner, Director of QASER Rural Development project (Governorate of Matrouh), briefed the meeting on the objective and activities of the project. He pointed that the project is an Egyptian and German project which started in 1988 with a three year orientation phase. The project agreement was extended twice since then. The aims of the project were to increase incomes of the rural population in environmentally sound and sustainable ways, with special attention to the support of women and rural poorest population, through the improvement of the use of soil and water resources, increase plant production of fruit tress, cereals and vegetables and increase returns from animal production.

32. The project aims to support the Government’s will and efforts for rural development of the entire North-Western coastal zone.

33. A brochure relevant to the project was distributed to all participants.

34. Mr. M. Kandel, Director of Reconstruction and Development Authority for the North-West Coastal Zone - Ministry of Reconstruction, briefed the meeting on the role of his organisation in the implementation of the various international projects in the area (QASR, LUPEM, World Food Programme, World Bank). He expressed his continued readiness to and support for the smooth implementation of the UNEP/MAP CAMP project. At the end of his briefing he suggested that all reports and studies pertaining to the CAMP project be translated into Arabic in order to make better use of them.

35. The meeting took note of the two statements and decided:

a. to pursue and strengthen the involvement of local experts in the CAMP project;

b. to ensure proper coordination between the CAMP project and the other on-going projects and activities in the area in order to come out with a real added value;
c. to translate the documents into Arabic.

**Agenda item 6 - Conclusions and recommendations**

36. At the end of the presentation phase, the meeting reviewed and adopted a set of general recommendations addressed to the Egyptian authorities and to UNEP/MAP.

37. The recommendations are attached as Annex XII to this report. A list of the main reports and documents related to the project is attached as Annex XIII to this report.

**Agenda item 7 - Closure of the meeting**

38. The Chairman of the meeting thanked all participants for their contributions and expressed his appreciation to the local authorities for hosting the meeting in Matrouh.

39. Mr. I. Dharat expressed on behalf of MAP and its regional centres, his thanks and appreciation to all participants for their contributions to the meeting. He also expressed his thanks to the Egyptian Environmental Affairs Agency (EEAA), to the authorities in Matrouh and to the national experts from the University of Alexandria for their continued support, dedication and cooperation.

40. He pointed out that the meeting was able to review various studies and reports and to notice that good progress has been achieved so far in most of the activities within the framework of the Fuka-Matrouh CAMP project. However, certain activities were not progressed to the level of expectation. He expressed the hope that tangible progress would be made in order to complete the whole picture relevant to this project.

41. He pointed out that besides presenting the output of the various activities to the Egyptian authorities, the meeting has achieved another objective by giving the opportunity to MAP officials, international, national and local consultants to meet together and exchange views, information and data and to review progress achieved and problems encountered in the course of preparation of the various studies.

42. He pointed out that it was decided to shorten the duration of the meeting by one day in order to give the opportunity to various MAP officials and consultants to undertake individual consultations in Alexandria and Cairo on the future programme relevant to the project.

43. The Chairman declared the meeting closed on Tuesday, 19 September 1995 at 13.00 hours.
OBITUARY

While finalizing the report of the meeting, the sad and shaking news of the untimely death of Dr. Nabil El-Fishawi, Professor of Marine Geology at the Coastal Research Institute of Alexandria and prominent Consultant at UNEP/MAP, was received. Dr. El-Fishawi has been in a honorable duty of serving his Country in the Fuka-Matrouh CAMP project. His sudden death, due to a car accident while returning back from the Matrouh Consultation meeting, was a great loss for his family, the Egyptian Government, UNEP/MAP and all his colleagues.

God bless his soul
ANNEX I

LIST OF PARTICIPANTS
ANNEX I

LIST OF PARTICIPANTS

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Report of the first
Presentation Meeting
of the Fuka-Matrouh
Coastal Area
Management Programme

Matrouh
18-19 September 1995
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ANNEX II

AGENDA
ANNEX II

PROVISIONAL AGENDA

1. Opening of the meeting

2. Coastal Area Management Programme of MAP

3. Presentation of activities carried out in the framework of the Fuka-Matrouh coastal area:
   
   3.1 Systemic and prospective analysis including development-environment scenario for the area (BP/RAC)
   
   3.2 Implication of climatic changes in the coastal area of Fuka-Matrouh (MED UNIT)

   3.3 Integrated planning and management study for the coastal area of Fuka-Matrouh (PAP/RAC):
      
      3.3.1 Integrated planning and management study
      3.3.2 Geographic Information System (GIS)
      3.3.3 Carrying capacity assessment for tourism

   3.4 Development of environmental legislation and institutional framework (MED UNIT)

   3.5 Protection and management of Specially Protected Areas and Historic Sites (SPA/RAC)

   3.6 Soil erosion and desertification (PAP/RAC)

   3.7 Water resources management study (PAP/RAC)

4. The remote sensing for the assessment of natural resources in the coastal area of Fuka-Matrouh (ERS/RAC)

5. Other business

6. Conclusion and recommendations

7. Closure of the meeting
ANNEX III

COASTAL AREA MANAGEMENT PROGRAMME FOR
THE FUKA-MATROUH AREA
STATEMENT BY MR. IBRAHIM DHARAT
Senior Programme Officer

to the

FIRST PRESENTATION MEETING

MAP COASTAL AREA MANAGEMENT PROGRAMME FOR THE
COASTAL AREA OF FUKAH-MATROUH

Matrouh, 18-19 September 1995
Mr. Chairman, Ladies and Gentlemen,

First of all allow me to avail myself of this opportunity to welcome all of you on behalf of Ms. Elizabeth Dowdeswell, the Executive Director of UNEP and Mr. Lucien Chabason, Coordinator of the Mediterranean Action Plan (MAP) who due to unexpected event was not able to participate in this meeting.

May I also express on behalf of UNEP/MAP our gratitude to the Egyptian Environmental Affairs Agency (EEAA) represented here by its Chief Executive Officer, Mr. Salah Hafez and to the Governorate of Matrouh, represented by Mr. Zahir Abdelrahman, the Governor of Matrouh Governorate for hosting and organizing this meeting.

Before I deliver my brief introductory statement let me, Mr. Chairman, express my personal heart feelings not only as the Coordinator of the Fuka-Matrouh Coastal Area Management Programme (CAMP) but also as a Libyan citizen who was born, educated and spent a good part of his life in this beautiful city. This occasion gives me great pleasure and satisfaction.

Mr. Chairman,

During the first decade of the Mediterranean Action Plan (MAP), it was recognized that the bulk of MAP's activities has been focused on the monitoring of the state of the sea and interventions aimed at improving the state of the natural system. The emerging understanding that the sources of pollution are mostly (80%) land - based and the necessity for the harmonization of regional and global development with the reception capacity of the environment, which calls for a permanent process of integrated planning, as well as for a rational management of the limited resources available in the region, has led to the refocusing of MAP on activities carried out in coastal zones.

The refocusing of all MAP activities, within the framework of the Coastal Areas Management Programme (CAMP) launched in 1989, is viewed as the most concrete phase of Mediterranean cooperation.

Within this programme, the problems of environment and development are dealt with in an integrated way, i.e. a coastal area is approached from all its aspects and their mutual interdependence. Up to now twelve Coastal Areas Management Programme were selected in cooperation with the Mediterranean Coastal States. The Fuka-Matrouh paroject is one of these twelve projects. The philosophy behind these coastal projects is to help the states define, or redefine, the development of problem areas while respecting the environment; mobilize towards this end national investments and promote greater international cooperation. The financial interventions of the World Bank, and the European Investment Bank in other CAMP projects is a clear example.

With regard to the Fuka-Matrouh CAMP, the general strategy is based on the principle of sustainable development and integrated planning and management of coastal
resources. The thirteen activities which were embodied in the Agreement signed with the Egyptian Government should lead to the preparation of an environmental management plan, integrating all knowledge gained through individual actions, with an objective of protecting, rationally utilize and ensure sustainable management of natural coastal and marine resources, over a relatively long period of time and resolving the existing environmental conflicts and setting up the optimum paths of the future dynamic development, by integrating the environment in social and economic development and land-use policies.

The project is expected to provide the following benefits:

- improve the state of environment of the area;
- protect nature and protect and enhance sites and landscapes of ecological or cultural value;
- incorporate environmental considerations into development planning activities and decision-making process;
- enhance national and local capacities in solving various development and environmental problems (you will note from the forthcoming presentations that various training courses were organized for national and local experts);
- transfer of knowledge from developed countries, and relevant international organisations to the national and local institutions; and
- create conditions for responding to some accidental situations.

Mr. Chairman,

I do not want to continue further on this introductory statement, the outputs of the project will be presented in a final Presentation Conference to be convened in this city during June/July 1996. However, it is also envisaged that two or three important activities need to be followed up through adequate financial support of relevant international financial institutions or programmes.

During the three days of this meeting you will hear in more detail the progress achieved and problems encountered in each of the activities of the project through the various presentations by my colleagues from MAP system and from the national and local consultants. In this occasion allow me to extend my thanks and appreciation to all of them for their dedication and cooperation.

By the end of these three days we envisage to consider few preliminary recommendations to be submitted to the Egyptian side.

As for the coming period, it is expected that all activities would be completed by May 1996, with the submission of the final report.

Thank you Mr. Chairman, Ladies and Gentlement for your attention.
ANNEX IV

SYSTEMIC AND PROSPECTIVE ANALYSIS INCLUDING DEVELOPMENT-ENVIRONMENT SCENARIO FOR THE AREA
FUKA-MATRUH CAMP

FIRST PRESENTATION AND CONSULTATION MEETING

BP/RAAC CONTRIBUTION:

SYSTEMIC AND PROSPECTIVE ANALYSIS
INCLUDING DEVELOPMENT ENVIRONMENT SCENARIOS

by: A. Hoballah, BP Team Leader
Prof. M. Ayyad, Consultant
Dr. K. Fahmi, Consultant
Dr. W. Gamaleldin, Consultant

MATRUH
SEPTEMBER 1995
FUKA-MATRUH CAMP
FIRST PRESENTATION AND CONSULTATION MEETING

BP/RAC CONTRIBUTION:
SYSTEMIC AND PROSPECTIVE ANALYSIS
INCLUDING DEVELOPMENT/ENVIRONMENT SCENARIOS

Considering the nature of our activity, and mainly the fact that we need to have the opinion of concerned decision-makers before making our results public, if the study is properly made, my presentation will go through some specific background concepts and methodology, then organisation and progress of the work and finally some questions for scenarios.

BACKGROUND

BP/RAC elaborates frameworks that show the interactive relationships between environment and development within and between countries of the Mediterranean basin. These frameworks are expected to make available for national and local authorities, as well as for decision-makers and planners, useful information that will assist them in the preparation and implementation of an environmentally sound development.

To build up these frameworks, BP/RAC applies the systemic and prospective approach, one of its outputs being scenarios. The results are an analytical combination of major dimensions (demography, international/regional context, development strategies, main economic sectors (agriculture, tourism, transport, key environmental components (soil, water, coast). A coherent and realistic set of evolution hypothesis draws the path for the elaboration of scenarios over a period of 30-50 years. Deliberately contrasted, the scenarios are important tools for thought, dialogue and action.

The systemic and prospective methods, tools and products are mainly intended to assist local and national decision-makers in:
- better understanding the development/environment relationships,
- identifying key actors, actual and potential.
- identifying conflicting zones for use and management of resources, and potential/critical breaking points,
- identifying evolutions and trends, and
- drawing down future imagies for a sector and a region.

Considering the large scope of its analysis that would have to go through social, political and institutional questions, this exercise presupposes and requires a clear and resolute commitment from concerned authorities and should involve a multidisciplinary team of experts.
CONCEPTS AND METHODOLOGY

T1
Basically, the Blue Plan approach is structured on population, human activities, exploitation of resources and environment. Therefore, it takes into consideration the whole system of the bio-, socio- and techno-spheres, going through each of these sub-systems, looking at the interactions from one to another and analysing the impacts, feedback and looping effects, mainly related to depletion/degradation of resources.

T2
The system to be considered for study and analysis, and in our case to analyse relationships between economic development and environmental impacts, is in fact an intellectual construction for a given purpose and constituted of chosen elements in dynamic interaction.

T3, T4, T5
The usefulness of a systemic and prospective approach depends upon the clear answer to the questions "for whom" and "why". This is not as easy as it may appear mainly when considering the interest evolution and the actors changing during the study period. Usually, the system’s understanding is structured upon mapping outlines, relevant internal/external and influential/dependant parameters or variables, and major actors, all combined through a structural analysis so as to identify the most determinant parameters, the constraints, trends and processes. Then a relevant set of parameters' evolution hypothesis is worked out with concerned actors and experts before imagining a certain number of scenarios.

T6
Many scenarios could be elaborated but prerequisites of clearness, simplicity, probability, consistency, relevance, adequacy, practicibility and usefulness have limited the study to five scenarios at the mediterranean level. For our region of Fuka-Matruh, three scenarios will be proposed: a reference/continuation trend one, an improved trend one and an alternative/sustainable development one.

For our study, the geographic reference unit is the Governorate of Matruh and not the limited project area eventhough this area will have to be considered when and where appropriate.
The difficulties facing the systemic and prospective approach are:
- clear objective with the necessary institutional support,
- constitution of a multidisciplinary team,
- identification of the system and sub-systems,
- selection of most pertinent parameters,
- identification of key actors and their strategies and "game",
- evolution hypothesis and their coherence,
- acceptance of future images as a planning and decision-making reference framework.

ORGANISATION AND PROGRESS

The Blue Plan team in charge of this activity is composed of three partners: an international consultant from Turkey (Prof. Aruoba) familiar with BP approach, a pluridisciplinary team of Egyptian experts (under the coordination of Prof. Ayyad and Dr. Fahmi) and BP experts.

After the launching mission in April 1993, we made two missions to Egypt (December 1993 and November 1994), mainly to Cairo where most of the key actors and the decision-making process are concentrated. We had interesting discussions with concerned persons from international, national and regional institutions (UNDP, WB, EC, USAID, CEDARE, EEAA, ETA, WRC, NWCD, ), and very knowledgeable persons such as Prof. M. Kassas and Dr. A. Bishay.

The combination of several factors, probably foreseeable from the beginning, have caused tremendous delay in the achievement of this activity. All directly concerned partners share responsibility in such a delay, with specific doses of time, availability, coordination, money, interest and willingness.

For the time being, three sets of reports were prepared:
1. Data and knowledge required for the CAMP, by Prof. M. Ayyad
2. Systemic and prospective analysis, national and regional, by Prof. C. Aruoba
3. Framework for trend and alternative scenarios, by Prof. C. Aruoba
4. Highlights on environmental problems and management, by Dr. K. Fahmi
5. Economic overview with reference to restructuring and adjustment, by Dr. W. Gamaldin
6. Economic future of the NW Coast, by Dr. O. El Hakim
Reports 1, 2 and 3 are more or less final; report 3 will be completed soon by an actors' game analysis and a more detailed scenarios description. Reports 4 to 6 have not yet been reviewed (just received). A 7th report on impacts on environment (from the previous reports' analysis) is under preparation.

All these reports will then need to be "combined" in order to have a proper understanding of the Egyptian and Regional (Matruh) systems, to identify a set of relevant and pertinent parameters, to identify a coherent set of hypothesis and to propose realistic (frameworks for) trend and alternative scenarios.

PRELIMINARY FRAMEWORK FOR HYPOTHESIS AND SCENARIOS

Major environment problems are:
- active soil erosion,
- loss of natural vegetation,
- wind erosion,
- water erosion,
- groundwater pollution,
- pollution of coastal waters,
- loss of natural landscape,
- destruction of limestone ridges, and
- eventually the impact of the planned nuclear energy plant for water desalinisation.

The future of the Matruh region will depend upon:
- nature and importance of settlement of bedouin population,
- attraction of other national population,
- development of tourism,
- development of agriculture,
- infrastructure and communication network, and also,
- relations with Lybia,
- availability, quantity and quality of water,
- impacts of major national restructuring and adjustment programs.

However, any development for this region will have to take into consideration:
- the limited comparative advantage for coastal international tourism,
- the increasing demand for national coastal tourism,
- the non availability of reliable sources of water,
- the relative soil infertility and vulnerability to erosion,
- the remnants of the second world war. and
- the institutional and administrative organization.

Major points or questions of interest are the following (not in order of importance):
- what increase of population is probable, possible and realistic,
- what is the Matruh Governorate environment carrying capacity, mainly from the points of view of water and soil regarding population, agriculture and tourism,
- what reasonable quantity of water could be made available from the different sources, that could satisfy increasing demand of population and economic activities,
- what are the fishing potentialities and sheep breeding for local consumption and exports,
- does an important port in Matruh present a comparative advantage to the ones of Port-Said, Alexandria and Benghazi,
- what are the opportunities and comparative advantages for transit, services and industrial activities,
- what would be the impact of the two irrigation canals diverting water from the Nile, in the north from Borg Al Arab to Daba'a and in the south to Rahah Al Nassiri where a huge sugar beat project is planned,
- could the water from Siwa Oasis and Qattara Depression be used for other purposes in the region,
- what the prospects for and impacts of oil and gas in the region,
- what would be the environmental impact of the destruction of the limestone ridges, in addition to dust pollution,
- to what extent can the January 1994 Law (forbidding any construction up to 200 m from the coastline) be implemented and what be the impact on investments on secondary houses and tourism resorts.

For the scenarios preparation, discussions will be engaged with national, regional and local actors and decision-makers, individually and in multidisciplinary groups so as to confront theirs views and analysis, in order to come out with a realistic future image for the region.

These discussions will cover the previous questions, the selection of the most determinant parameters and the hypothesis that would be considered for the major dimensions 'population, national development
strategies, international economic and political context, land use management and environmental considerations)

FOLLOW-UP

The knowledge of the system is near to completion. A synthetic and analytical combination is missing. A preliminary identification of hypothesis and prospective images has been made by international consultants; review and completion will be done soon by Egyptian experts in coordination with Prof. Ayyad, Dr. Fahmi and EEAA responsibilities. Hopefully, trend and alternative scenarios will be represented graphically using GIS. Finally, a debate seminar involving concerned actors, decision-makers and experts will be organized early 1995, so as to finalize this study, in any case, before May 1996.

A. Hoballah
BP/RAC Deputy Director
Relationships between environmental components and development activities

- Vegetation
- Waters
- Soils
- Air
- Value of resources
- Population
- Uses and Drowffs
- Coastal Concentration
- Impacts - Risks
- Discharges
- Wastes
- Rural
- Urban Production and consumption
- Agriculture
- Industry
- Energy
- Tourism
- Transports
- Impacts of the activities on the values attributed to resources

- Sustainable Development
  - Improvement of living environment
  - Pollutions and risks management
- Key-Words
  - Biosphere - species, habitats, nature conservation, biological diversity
  - Sociosphere - health, quality of life, urban ecology, cultural heritage and landscapes
  - Technosphere - prevention and control, clean technologies, inspection of products

Leading environment policies

Field of sustainable development
SYSTEM

AN INTELLECTUAL CONSTRUCTION

FOR A GIVEN PURPOSE AND CONSTITUTED OF

CHOSEN ELEMENTS IN

DYNAMIC INTERACTION

IN RELATION WITH PURPOSE

(IN OUR CASE TO ANALYSE RELATIONSHIPS BETWEEN ECONOMIC DEVELOPMENT AND ENVIRONMENTAL IMPACTS)

RELEVANT ELEMENTS ARE SELECTED AS

• KEY DIMENSIONS

• MAJOR ECONOMIC SECTORS

• MAIN ENVIRONMENT COMPONENTS
SYSTEMIC AND PROSPECTIVE ANALYSIS-SCENARIOS ELABORATION

OBJECT: CLEAR, FOR WHOM - WHY

SYSTEM UNDERSTANDING
- MAPPING - VARIABLES - ACTORS/DECISION MAKERS
- CONSTRAINTS - TRENDS - PROCESSES

PROSPECTIVE
- HYPOTHESIS

DEVELOPMENT PATHS
- CONFLICT ZONES AND BREAKING POINTS
- FUTURE IMAGES - SCENARIOS
BLUE PLAN EXERCISE WAS BUILT ON:

T4

FIVE DIMENSIONS
INTERNATIONAL ECONOMIC CONTEXT
DEMOGRAPHY-POPULATIONS
NATIONAL DEVELOPMENT STRATEGIES
SPATIAL MANAGEMENT (LAND-USE,...)
CONSIDERATION OF THE ENVIRONMENT

FIVE SECTORS OF ACTIVITY
AGRICULTURE
INDUSTRY
ENERGY
TOURISM
TRANSPORT
(URBANIZATION - LITTORALIZATION)

FIVE ENVIRONMENTAL COMPONENTS
SOIL
WATER RESOURCES
FOREST
COASTLINE
SEA

FOUR LEVELS
GLOBAL-MEDITERRANEAN
NATIONAL
REGIONAL
LOCAL-COASTAL
SCENARIOS

STARTING POINT (RESULT OF KNOWLEDGE OF SYSTEM)

ASSUMPTIONS (CLEARLY STATED)

POSSIBLE PATHS (WITH CRITICAL POINTS AND DECISIONS)

FINAL POSSIBLE IMAGES OR SITUATIONS

SCENARIOS MUST BE:

CLEAR/TRANSPARENT IN ORDER TO BE UNDERSTOOD BY ALL

PROBABLE WHICH DOES NOT EXCLUDE HAZARDS

CONSISTENT BOTH INTERNALLY AMONG THEMSELVES AND AT ALL LEVELS

RELEVANT IN TERMS OF THE DESIRED OBJECTIVES AND

ADEQUATE i.e. SUFFICIENTLY LARGE IN NUMBER TO COVER A WIDE RANGE OF POSSIBLE FUTURES (A SET OF SCENARIOS) BUT NOT SO MANY AS TO BE REDUNDANT OR PRODUCE MORE COMBINATIONS THAN CAN BE HANDLED.
TREND SCENARIOS

T1 REFERENCE, CONTINUATION OF OBSERVED TRENDS

T2 RECESSION, WEAK GROWTH AND NO POLICY CO-ORDINATION BETWEEN WORLD LEADERS

T3 IMPROVEMENT, SUSTAINED GROWTH AND BETTER CO-ORDINATION OF POLICIES

TREND SCENARIOS ARE GENERALLY COSTLY FOR THE ENVIRONMENT

ALTERNATIVE SCENARIOS

A1 MEDITERRANEAN, CO-OPERATION BETWEEN EUROPE AND SEMC, EEC DRIVING FORCE

A2 REGIONAL, GROUPING OF SEMC AND STRENGTHENING OF CO-OPERATION

ENVIRONMENT AND LAND-USE POLICIES ARE BETTER INTERNALIZED IN PLANNING AND DECISION-MAKING PROCESS
A Contribution to Fuka-Matruh
Coastal Area Management Programme

A Framework for Accumulating
Consequential Data and Knowledge

by

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May 1995
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DEVELOPMENT IN THE SOCIAL AND POLITICAL PERSPECTIVE

The evaluation of the impact of development on different social strata is extremely important. According to this impact, definable interests of each stratum could be defined. This relation, or rather reaction to the development process as an external motive will no doubt vary according to cultural and economic standards of the Bedouin population. In general, most Bedouin are hesitant to accept development projects for fear that the increasing immigration from the Nile Valley and Delta into the region could create a situation where the lands could be sold. In addition to a high rate of illiteracy, they realize that they are weak competitors on the labor market because of their limited experience confined mainly to sheep breeding and traditional agriculture.

In fact, the Bedouin population should be the prime beneficiaries of the development process that should in the first place undertake upgrading of their living standards, and secure their settlement in the area. In this respect the following remarks are to be taken into consideration while planning for development:

- Social characteristics should be considered as a base in planning for development.
- Setting up a clear policy for land tenure has a vital role in the settlement of population and also in their participation in development programs.
- Agricultural projects are of prime importance to the population of the region, and therefore, should be a tool to create confidence between the Bedouin and the State represented by the executive organizations and authorities.
- Industrialization of agricultural and animal products executed by local population should be considered as an important sector of development.
- The development process will never achieve its targets without the conscious, active participation of the local citizens, and their full approval of the intent of the authorities undertaking the development and reconstruction programs. They should be convinced that the ultimate goal of the said process is in the interest of the local citizens.
- Bedouin, often have doubts about the way the government will deal with the land tenure system in the area. There is an increasing doubt that land would be taken in a way or another for development projects that have nothing to do with them. Therefore, it becomes necessary to legislate tenure in a way that conforms with the
development programs, and to actively incorporate people in these programs, and to secure confidence between interested parties.

- On account of their day to day living in the desert environment, and their intimate knowledge of the particulars of their environment, the people who work in agriculture and grazing should be actively involved in the discussion and initiation of development projects.

- Some citizens have uninvited capitals. They have achieved optimum rate of return from trade and land speculation. This asset could be used as financial resources for the development projects.

The agriculture and grazing activities are the economic basis of development, therefore, they should take precedence in the region, because these activities are:

- the pole of the socio-economic life in the region, they represent the main sources of income, they engage more than two thirds of the population of the area, and finally, they provide population with the needed food;

- the activities that encourage population to settle in the area, and to show active participation in the development projects;

- the main activities that have enormous development potential due to the specific characteristics of the area;

- the main sectors that have numerous cross relations and interdependence.

Concerning the industrial activities, focusing should be on the manufacture of food, in addition to handicrafts expressing the existing environment. These industries require small space, limited financing, and simple production methods; and they complement the prime activities of agriculture and grazing. The projects of agriculture, grazing and handicrafts should integrate with the tourism activities, which are capital intensive, in the from of a cluster of touristic villages that will have agricultural surrounding, necessary for providing the tourists with food and folkloric souvenirs. Infrastructure projects that serve the different development projects, should be promoted.

The integration between the local, regional and national objectives should be fulfilled in the development programs. The local objectives are: upgrading the standards of living of the citizens of the region by securing a convenient level of services and job opportunities as for example - the lambs production, pasture development, handicrafts, household poultry, land reclamation projects and distributing a considerable share of these projects on small holders and cooperatives.

The choice between development strategies should take place in a clear pattern of defined authorities and parties that will cooperate in the process. Strategy depending basically on public and governmental investments are not expected to be
similar in philosophy, contents or dimensions to that which depends on individual initiative, or that which depends on foreign investment and joint ventures. It is conceivable that the comprehensive development process requires the corporate efforts of all these parties, but they are not expected to be all of the same relative importance in different economic sectors. Therefore, every economic sector will have to define the party that will lead the investment in its domain, a matter which should not limit the capability of the sector to change leadership from time to time according to the phased development of the sector.

The role of women must be carefully considered in the development programs. This role is discussed in some detail by El-Miniawy et al., (1992) in the report of El-Qaser Area Project. They conceive the Bedouin society as strictly patriarchal, and as hierarchical in terms of the privileges granted for age and position in the family. Once a male becomes adult his decisions supersede those of women. However, older women, may have a say in certain matters, but generally men have to approve most decisions, especially those involving outsiders (such as training) and matters of income (such as the undertaking of a new economic activity in the household). As women are responsible for the daily running activities of the household including the preparation of food, the making of carpets, and sometimes cultivating small patches of vegetables and breeding poultry, they are, at least, indirectly responsible for significant positions of the in-kind income of the family. Their contribution to cash income is, however, minimal. Older women in particular, have privileges in mobility and decision-making that are not normally given to younger women. For instance, an older woman, particularly the Sheika (wife of the head of household) can travel to Marsa Matrouh, is allowed to converse with men and can participate in some decision-making. In some instances, especially due to the death of the head, the Sheika may run the household.
CHAPTER IX

ENVIRONMENTAL PROTECTION AND CONSERVATION OF NATURAL RESOURCES

Marine Pollution

There are several sources of marine pollution in the western Mediterranean coastal region of Egypt: (a) off-shore oil exploration and exploitation, (b) oil resulting from shipping, and (c) harbour pollution from ships, shipyards and port facilities and traffic. Cities, mainly Marsa Matrouh do not discharge liquid effluent (mainly sewage) in the sea, but in sandy layers which absorb the in-flow.

Matrouh is one of the Governorates responsible for combating coastal pollution in the Mediterranean sea by supervising the industrial, commercial and housing activities which have direct effects on the quantities of organic liquid and solid waste loads discharged into the sea. Besides, the Governorate supports projects for protection against coastal erosion, and cleaning the beaches by getting rid of the solid wastes and oil pillets coming from the sea, as well as dead algae and other marine biota. The Ministry of Health is responsible for monitoring the degree of safety of coastal water especially during summer by examining water samples in its laboratories. Besides, the Ministry of Health samples fish and other sea food biota for analysis to make sure that they are safe for human consumption. The El-Alamain Port is used mainly by WEBCO Petroleum Company. But due to limited output (7000 b/day) of these fields, the activity of this port is low. The port is equipped with facilities for water treatment for separating the oil and discharging the treated water in the nearby depression.

Information about the levels of coastal pollution is scarce. There is no continuous monitoring plan, and therefore it is difficult to evaluate the situation. Nevertheless, there are some studies that might give useful indications. For example, samples were collected of oil pollutants in the beaches along the coast from Alexandria to Marsa Matrouh in 1974, by the National Research Council. It was found that most samples were affected by the climate, which indicates that they had reached the beach after a considerable time after they were discharged to the sea. Oil establishments always take the necessary precautions to avoid pollution as far as possible. But, in fact
it is not only the matter of having the facilities to do this, but also the good management needed for high efficiency of using them.

**Air and Soil Pollution**

Air and soil pollution in Matrouh Governorate has been trivial, as there has been no major polluting plants in the region, and the use of pesticides and fertilizers in the soil has been limited. However, two activities which started recently and that may cause pollution, particularly in the eastern part of the Governorate (from El-Hammam to Fuka) need to be assessed. The huge amounts of dust generated from the quarrying of limestone ridges for brick making, and the use of pesticides and fertilizers in irrigated agriculture with the extension of El-Nasr canal.

**Land Degradation and Species Impoverishment**

There are direct and indirect causes for ecosystem degradation and species impoverishment in the western Mediterranean region of Egypt. The direct causes are related mainly to the ways in which man has used and misused the natural resources of the region since its early history. It is known that the region has a more favorable moisture regime and a better biological potentiality than most of the Egyptian deserts. But the continued uncontrolled woodcutting, overgrazing and rainfed farming for cultivation of annual crops have dominated the region for many centuries. The net result has been the reduction of vegetation cover and the impoverishment of flora and fauna. This process has gone at a quicker pace in the nineteenth and twentieth centuries.

More recent land-use activities are even more devastating. Intensive irrigated agriculture which was started some twenty years ago in Burg El-Arab area, is to be extended further. The area between Marsa Matrouh and Salloum, witnessed during the last few years extensive clearing of natural vegetation for rain-fed cultivation of wheat, an activity which will have a very serious impact not only on the existing biota, but also on any future possibility for reversing the process of land degradation that has already started to take place. Other activities are taking place, which have more local effects on the vegetation of the region. For example, the obliteration of the limestone ridges for making bricks is endangering many chasmophytic species as well as diminishing the possibility of water-harvesting, and the occupation of large areas of the coastal dunes by summer resorts is endangering many psammophytic species. Environemntal hazards caused by summer resorts can be summerized in the following points:

- Resorts are obstructing the view.
- Resorts are busy only during summer.
• No facilities for yearround accommodation.
• Shore erosion due to shoreline alternation.
• Degradation of sand dune to the booming touristic resorts and villages.
• Oil and garbage pollution of the coast.
• Pollution of the valuable ground water layer under the sand dunes due to wastewater seepage from the touristic resorts.
• Potential coastal water pollution due to the disposal of sewage and soil wastes.

Conceivably, beside the obvious deleterious effects of these activities on the floristic components of the ecosystem, these effects will extend to the fauna and the microbiota. Besides, the obliteration and fragmentation of habitats will have serious impacts on the process of speculation in the long run.

Restoration and Development of Rangeland

The causes of degradation of arid rangeland in the Mediterranean coastal region of Egypt, are mixes of environmental, socio-economic and socio-political effects. Therefore, remedies must be diverse and have to be tailored to the problems and needs of the inhabitants. At present, there is no range management policy for the region. Plans for grazing management in the past did not achieve their objectives, apparently due to: (a) lack of in-depth consultation with people directly affected by the plans and the reasons for the changes. The people felt the plans were developed and imposed on them from the outside. (b) Lack of genuine government support for the plans due to political pressures or to lack of appreciation and/or understanding of the problems facing the rangeland of the region. For example, there was no range management section and no staff was allocated specifically to supervise the implementation of these plans.

Three main lines may be suggested for the initiation of a long-term strategy for the restoration and development of degraded rangelands in Matrouh Governorate. Activities along these lines should be directed towards providing demonstration pilot experiments for application on a larger scale by decision-makers and land-users as a long-term strategy. The following are the three main lines of activities: (a) establishment of demonstration pilot areas for protection and controlled grazing in each of the main habitats and biotic communities; (b) initiation of a cooperative system for grazing management between the main social sectors (tribes); (c) formation of an extensive program for range improvement by the propagation of multipurpose species (mainly native species, but also a limited number of introduced drought resistant species); (d) Establishment of nature reserves.
It is necessary that the decision-makers and land-users participate in the planning and execution of the activities along these three lines, and that extension services and incentives be ensured in order to encourage their participation.

(a) Pilot Areas for Protection and Controlled Grazing:

Degraded land can simply be removed from utilization in demonstration pilot areas (grazing or cropping), completely or partially, and allowed to recover for adequate periods. The assignment of protected areas must be made in the first place, in agreement with the local inhabitants. The following plan may be suggested in order that the full advantages of protection may be achieved:

(1) The objectives of establishment of areas for protection and controlled grazing are:
   (a) demonstration of the merits of protection and controlled grazing to the inhabitants, in order to enhance the feasibility of a cooperative system of shifting or deferred grazing between tribes, (b) regeneration possibility for a seed reserve that could be useful for collection of seeds ad propagules for propagation of species, and (c) furnishing the possibility for study of changes with time of ecosystem components (plants, soil, animals, microorganisms), population dynamics of species, and ecosystem functions.

(2) One or more areas may be selected in each of the main habitats and biotic communities. It is to be decided in due time during protection whether full protection can be continued for some years, or an appropriate degree of controlled land-use should be decided at an early stage. The plot may be divided into a few sectors. One to be completely protected, and the other to be used for controlled grazing, in order to decide which would be better for a long-term strategy-controlled or deferred grazing.

(3) An agreement then should be made with the inhabitants for selection of the protected area, and for the compensation or the incentives they may receive in return for removing the area from utilization.

(b) Cooperative System for Grazing Management

The idea of initiating a system for cooperative grazing management in the rangelands should be explored with the heads of tribes. It is important that the inhabitants be convinced to establish such system and that the initiative comes from them. Such system would be based on grazing demarkated areas of range. Families in the cooperative are to be granted a license to graze a certain number of sheep for a specified period of time within the assigned area.

Although the ownership of most areas of rangeland rests with the government, traditional tribal territories are well known. The traditional tribal system of sanctions
and rewards appears to be still effective in organizing and resolving the problem of resource allocations among families belonging to the same tribe or to different tribes. It involves demarcating the site using strips of barley plantations and spreading the word among the other breeders that the area is preserved for use in late spring and summer. On the other hand, there is no organization charged with the task of range administration, management, or extension. While there are adequate institutions and facilities for training in the areas of plant taxonomy, phytosociology and range ecology, virtually no range management and administration training institutions exist in the country. It is unfortunate, however, that at present there are no technically qualified range management practitioners to apply the results of the extensive research accumulated over the past 30 years. It is unfortunate, also, that virtually no coordination (financial or technical) is taking place among the researchers from the different organizations.

Grazing control could be achieved by dividing the zone into a number of grazing cooperatives on the basis of the traditional territories. Each cooperative would manage its own territory under the technical supervision of a "Rangeland Agency". The Rangeland Agency will explain to the users the reasons for the management scheme and will solicit their input into the plan, e.g. application of the traditional tribal system of rewards and sanctions in range management. The agency will assist the coops in formulating the details of the management plan (e.g. providing grazing capacity estimates, determining the boundaries of the grazing cooperatives). The agency will also assist in the future evaluation of rangeland condition. It is believed that the active participation of the users is the key to the success of the management plan. At first "a model" grazing cooperative should be established in an area where least resistance to grazing control is expected.

In addition the present system of universal, government subsidized, concentrated feed distribution has undoubtedly contributed to the present deterioration of rangeland, and should be stopped immediately and replaced with a system designed to aid in the efforts to conserve the rangeland resources. Subsidized feed distribution could be tied to the participation in the grazing cooperatives and possibly, to range improvement practices (e.g. forage plantation). The grazing cooperatives will implement range improvement measured within their respective territories with technical assistance from the Rangeland Agency.

It is proposed that range plants seed production cooperatives be established to supply the necessary seeds and transplants for range improvement. The Rangeland Agency is to assist in the establishment of nurseries through providing technical assistance and possibly through securing initial seed supply and necessary land.
The proposed rangeland agency would have the authority to restrict barley cultivation in areas judged to be sensitive to erosion or marginal for barley production. The agency, at the same time, will assist the grazing cooperatives in implementing measures aiming at improving barley yield and forage production from barley fields (e.g. use of self-seeding legumes such as subterranean clover, medics and vetches).

The increase in the number of water points in the northern part of this region has contributed to the degradation of rangeland. The decision to clear or build new cisterns for animal use should be made by the proposed "Rangeland Agency" after consideration of range condition.

Success of the proposed system for grazing management is related to close attention to timing of grazing to match the seasonal and annual changes in there productivity of forage plants, to ensure that animals graze plants at their most nutritious stage, favors plants regeneration, and protect vegetation cover that bind the topsoil.

The possibility for establishing some form of such cooperative system may seem extremely difficult to formulate and apply within the present sociopolitical structure, and in view of the absence of secure land tenure, as well as the modesty of extension services and incentives. But the idea itself deserves due attention and trial as a basis for a long-term policy for restoration and management of rangelands in the Mediterranean region of Egypt at large.

(c) Propagation of Multipurpose Species

Perhaps this is the most important practical and applicable line of activity to restore and develop the degraded rangelands in Matrouh Governorate. It is conceivable that the present land degradation in the region is the direct and immediate result of overgrazing, mechanical removal and uprooting of the woody plants together with ploughing out the herbaceous species. Therefore, beside protection and management of grazing through a cooperative system, it is of great importance that an extensive program be formulated and executed for the propagation of multipurpose species, (woody species in the first place, but also herbaceous species of grazing and other values), and essentially native species. (but also a few introduced multipurpose drought resistant species). The major objectives are to meet the basic needs of inhabitants for feed and fuel, and to release the over-utilization pressure on vegetation and soil.

Many high-ranking government officials perceive artificial reseeding as the only realistic large-scale measure to solve the problems of rangeland overgrazing and deterioration in the region. In other words, they view artificial reseeding as an
alternative to proper management. This attitude is extremely dangerous and could lead to wasting funds and efforts.

Artificial reseeding of introduced species cannot substitute for proper range management. In fact, open management is an essential prerequisite for the establishment and maintenance of a successful stand of an artificially seeded range. Without proper management, the introduced vegetation will disappear, even at a faster rate than the original vegetation which evolved over thousands of years under the harsh climatic and misuse conditions.

Range improvement through artificial reseeding in this region has been shown to be possible only in selected sites with favorable soil characteristics and additional soil moisture supply (e.g. overflow). The total area suitable for reseeding represents only 9% of the total area of rangeland, and most of that area is currently used for barley and horticulture crop production.

The average annual precipitation is too low to allow for successful reseeding using the currently available technology. A minimum of 250 mm of annual precipitation would be needed for effective and cost effective artificial reseeding.

Most of the species recommended for artificial revegetation require extensive preparation for successful establishment. This would result in the destruction of what is remaining of the highly adapted original vegetation and will render the soil more susceptible to erosion forces.

This however, does not mean that artificial revegetation with introduced species should be totally excluded as one of the means of range improvement. It was intended, however, to emphasize the limitations and requirement for that type of range improvement and put it in perspective for regional planning purses. Artificial regeneration may be possible in specific sites: (a) Non-saline depressions and wadis with medium textured soils, receiving additional moisture from runoff water. These are found mainly in the coastal plain and in the wadis. The most promising species for such areas are Oryzopsis miliaceae, Phalaris tuberosa, Dactylis glomerata var. hispanica, Agropyron elongatum, Poterium sanguisorba and Atriplex numularia. Water conservation measures would improve the probability of successful establishment. Such measure may include waterspreading, contour furrowing, or small basins (e.g. 2 x 4 m in area. 5-10 cm in depth). (b) Deep sandy sites. These are found mainly in the Sidi Barrani and Daba regions. The main adapted species here are of the perennial grasses where surface stability is a problem. There are many methods available for this purpose, such as using mulch and polymers, and establishment of windbreaks using any plant material or residues that are locally available (e.g. common reed Phragmites communis) is quite effective.
The main premises that should govern such program are:

a) Promotion of the idea should be both at the level of the decision-makers, and at the level of land-users.
b) Propagation of species should be carried out with the minimal disturbance of the natural system, (e.g. no eradication of natural vegetation except in the narrow stripes prepared for cultivation).
c) Full participation of inhabitants at all stages of the program. Local groups can be selected, supervised and organized to execute the program.
d) At the start, limited experiments should be carried out in pilot areas in cooperation with local families, in order to demonstrate the merits of the program.

The program should be centered around the following main items: (a) Seed collection; (b) establishment of seed banks; (c) established of nurseries; and (d) demonstration field experiments.

(d) Establishment of Nature Reserves

Another possible approach to range improvement beside artificial revegetation is natural recovery in nature reserves. Natural recovery involves manipulation of animal numbers and distribution in such a way that the vegetation, particularly the desirable species, is given the opportunity to retain its vigor and abundance and to restore its productive capacity. This procedure does not necessarily require complete protection from grazing during the recovery period. In fact, complete protection from grazing may slow down the recovery process. Downward adjustment of animal numbers is the initial and most important step. Animal numbers can then be gradually increased as range condition improves, to the appropriate carrying capacity. The process may be slow and may not be possible in areas where serious deterioration in vegetation and soil conditions has taken place. In most areas, however, this is the only avenue available for improvement because site and climatic conditions do not allow successful and cost effective artificial revegetation. Water conservation (e.g. contour furrowing, water spreading) in the appropriate sites would speed the rate of recovery and increase the productive capacity of the range.

Beside the objective of natural recovery of defrauded vegetation, it is conceivable that nature reserves would achieve several other important objectives, especially if these reserves have the configuration of "Biosphere Reserves" of UNESCO Man and Biosphere Program. Biosphere reserves differ from most conventional types of protected areas in so far as they have multiple functions (UNESCO, 1993). These are essentially the integration of the needs of people with nature conservation (protection of genetic resources, species and ecosystems) with the objective of promoting sustainable development and associated cultural values, and
providing a logistic tool for testing land-use problems through interdisciplinary research and monitoring. Thus, biosphere reserves must, at least to some extent, address itself to all these basic concerns and their synergistic combination (Batiste, 1990). On this basis, the biosphere reserve must have a pattern that fulfills these objectives. The simplest pattern consists of a "core area" devoted to more or less "strict" protection, surrounded by a delineated "buffer zone" where only activities compatible with the conservation objectives can take place, and this in turn surrounded by a more or less defined "transition area" where cooperation with the population and sustainable resource management can be developed. In reality this pattern of zonation is bound to be more complex in many cases where cluster of core areas and buffer zones may be needed.
A contribution to
Fuka-Matruh Coastal Area
Management Programme

Systemic and Prospective Analysis
for an
Environment Friendly Management

Report I: Systemic and Prospective Analysis of National Socio-Economic Structure and Northwestern Coastal Region of Egypt

and

Report II: The framework of Northwestern Coastal Region Trend and Alternative Scenarios

by

Professor Çelik Aruoba
Consultant

June 1995
<table>
<thead>
<tr>
<th>ALTERNATIVE SCENARIO</th>
<th>THREAT SCENARIO</th>
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<tbody>
<tr>
<td>In warroom:</td>
<td>In warroom:</td>
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<tr>
<td>Accepte place secrat</td>
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<tr>
<td>Erance in warroom</td>
<td></td>
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<tr>
<td>A more balanced employmant</td>
<td></td>
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<tr>
<td>Efforts in the migration zone</td>
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<tr>
<td>Better migration practices</td>
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<tr>
<td>Continues</td>
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<td>Rapid growth of Manam City</td>
<td></td>
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<td>救 a whole</td>
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</tr>
<tr>
<td>Sogrowth down of urbanization in</td>
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<td>Higher growth rates in Manam</td>
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<td>Policy</td>
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<td>Continue with government</td>
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<td>Growth rates will reduce in</td>
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<td>Population:</td>
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<td>Migration:</td>
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<td>Employment:</td>
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</tr>
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</table>

I. POPULATION DIMENSION

TABLE 1

FOR NORTHWESTERN COASTAL REGION OF EGYPT}
HYPOTHESES FOR DEVELOPMENT/ENVIRONMENT/SCENARIO
## II. NATIONAL DEVELOPMENT STRATEGIES

<table>
<thead>
<tr>
<th>HYPOTHESIS</th>
<th>TREND SCENARIO</th>
<th>ALTERNATIVE SCENARIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberalization of the economy</td>
<td>Higher private sector activity in Matrouh Region</td>
<td>Higher private sector activity both in Egypt and Matrouh</td>
</tr>
<tr>
<td>continues</td>
<td>Slower tempo in rest of Egypt</td>
<td>Faster tempo</td>
</tr>
<tr>
<td>Intensifying of privatization efforts</td>
<td>Rapid expansion in Matrouh</td>
<td>Higher expansion rates in Matrouh</td>
</tr>
<tr>
<td>Investment</td>
<td>Weak-but stronger relationships with the Arab world</td>
<td>Stronger relationships with the Arab countries and the rest of the world</td>
</tr>
<tr>
<td>Integration to world market</td>
<td>Stronger relationships with Libya in Matrouh</td>
<td>Faster growth rates</td>
</tr>
<tr>
<td>Economic growth</td>
<td>Sluggish</td>
<td>Fast economic growth in Matrouh</td>
</tr>
<tr>
<td>Tourism</td>
<td>Rapid growth in Matrouh</td>
<td>Faster growth of all kinds of tourism</td>
</tr>
<tr>
<td></td>
<td>Slower expansion of Arab and western tourism in Egypt</td>
<td>Expansion of foreign tourism</td>
</tr>
<tr>
<td></td>
<td>Growth of touristic villages continues in Matrouh</td>
<td>Integration of touristic villages to regional economy</td>
</tr>
<tr>
<td>ALTERNATIVE SCENARIO</td>
<td>TENDENCY SCENARIO</td>
<td>HYPOTHESES</td>
</tr>
<tr>
<td>-----------------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>------------------------------------------------</td>
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<tr>
<td>Harmonious and agreeable Liberalization, unencumbered markets</td>
<td></td>
<td>Geopolitical situation</td>
</tr>
<tr>
<td>International cooperation</td>
<td></td>
<td>Possible protectionalist measures</td>
</tr>
<tr>
<td>Accessible EC market</td>
<td></td>
<td>USA leadership continues</td>
</tr>
<tr>
<td>Stronger relationships with Italy and France</td>
<td></td>
<td>Improved ties with Arab world</td>
</tr>
<tr>
<td>Very good accord with Arab world</td>
<td></td>
<td>Satisfied stability in Middle East</td>
</tr>
<tr>
<td>Full economic and political concord with Libya</td>
<td></td>
<td>Better and improving relations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>to IMF, IMF, etc.</td>
</tr>
<tr>
<td>ALTERNATIVE SCENARIO</td>
<td>TRED SCENARIO</td>
<td>PRIORITY</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------</td>
<td>----------</td>
</tr>
<tr>
<td>Poor landscape planning</td>
<td>Regional planning</td>
<td>Land use planning</td>
</tr>
<tr>
<td>Haphazard expansion of urban areas</td>
<td>Loss of irreplaceable beaches</td>
<td>Protected zones</td>
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<tr>
<td>Government predominance of central and decentering</td>
<td>Predominance of overuse of economic resources</td>
<td>Institutional aspect</td>
</tr>
<tr>
<td>Improper management of local control and development</td>
<td>( \text{not taken in consideration} )</td>
<td>Landscape</td>
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TABLE IV
<table>
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<tr>
<th>ACTIVITY</th>
<th>HYPOTHESIS</th>
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<tr>
<td>Measure public participation</td>
<td>Quality of environment</td>
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<tr>
<td>Assess social equity fairly</td>
<td>Natural resource management</td>
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<td>Time series trends</td>
<td>Governance role of central and regional</td>
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<td>Project management</td>
<td>Role of ERM</td>
</tr>
<tr>
<td>Concept of sustainability</td>
<td>Primary responsibility and</td>
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<tr>
<td>Full concern for northwest</td>
<td>Environmental considerations</td>
</tr>
</tbody>
</table>
A Contribution to Fuka-Matrouh CAMP

Highliths on environmental problems and management

and

Economic overview with reference to economic restructuring and adjustment

by

Dr. K. Fahmi and Dr. W. Gamaldine

Consultants
One million ha of irrigated land suffer from salinization

* Marine

Fish production has dropped by 70% in the Mediterranean

* Economic

Unsafe water and sanitation

0.000-100,000 80,000-100,000
1994

7,000-10,000 4,000-6,000
2005

Years of life lost per year from diseases related to

* Health

Lives lost per year from lack of safe water/sanitation

* Impacts

Pesticides

Existing treatment facilities is 2.8 million/m³ per day (waste water containing heavy metals and

- A total of 6.0 million/m³ of municipal waste water is generated per day, and the total capacity of

- A total of 331 large industries generate 2.4 million/m³ of waste water per day.

Quality

<table>
<thead>
<tr>
<th>MCM/Year</th>
<th>0.000</th>
<th>60,000</th>
<th>68,400</th>
<th>58,300</th>
<th>0.000</th>
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<tr>
<td>Demand</td>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Balance</td>
<td>2000</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Land

Land Resources

- Only 4% is inhabited - Population Density 1,400 person/km²
- 3.4% is arable land.
- Low arable land - man per capita ratio (0.04 hectares per capita - for Israel 0.04 and 0.10 for Jordan)

Impacts of Development Activities

- 30% of arable land has been degraded by water logging and salinization and urbanization.
- 12,600 hectares lost annually because of urbanization and water logging.
- Water is the limiting factor for land reclamation.
Health impacts

- Dust levels in Cairo have doubled over the last 20 years.
- Smoke in Cairo increased 15-25% during last five years.
- Lead in Cairo 2 times maximum safe levels.
- SO2 in Cairo 3 times international standards.
- TSP in Cairo 6-10 times local and international standards.
- High concentrations of air pollutants in urban areas particularly in Cairo and Alexandria.
- A total of 62 large industrial facilities generate industrial air pollution problems in 9 governorates.

Air Pollution
A total of 97 thousand hospitals bed generates 1.7 thousand tons of infectious and hazardous waste per day.

- 50,000 tons of hazardous industrial waste is generated per year.

A total of 10 million tons of municipal solid waste is generated per year, 3 million are only collected.

**Solid Waste**
- Municipal Wastewater: Total Capacity of Existing Treatment Facilities is 2,849,000 M³ Per Day. A Total of 6.631,793 M³ of Municipal Wastewater is Generated Per Day, and the
- Hospital Waste: A Total of 96,699 Hospitals Beds Generate 11,704 Lons of Infectious and Hazardous Waste Per Year.
- Hazardous Waste: A Total of 50,000 Lons of Hazardous Industrial Waste Is Generated Per Year.
- Solid Waste: A Total of 10 Million Tons of Solid Waste Is Generated Per Year.
- In 9 Governors: A Total of 62 Large Industrial Facilities Generate Industrial Air Pollution Problems. A Total of 331 Large Industrial Facilities Generate 2,387,126 M³ of Wastewater Per Day. Industrial Pollution:

Perceived Needs

Size of the Pollution Problem
Provision of safe water and sanitation

Provision of low-sulfur fuel oil

Provision of unleaded gasoline

Industrial sector clean-up

130-170 (US$ million)

GDP, 25% of defence spending). They could be broken down as follows:

Investment requirements for the next 10 years are estimated at US$370 to 450 million annually (only 1% of

lost tourism.

million and will increase to US$1.1 billion by the year 2005. Twenty-five percent of these figures are due to

Total Annual Social Cost of environmental degradation to the Egyptian Economy is estimated at US$600

in Egypt

Economies of Environmental Degradation
Inappropriate Policies

Environmental Management - Key Constraints

(1) Inadequate legislation:
- Legislation is partly inadequate, unrealistic, and unenforceable. No adequate financial support - monitoring
- Lack of comprehensive analytical framework for environmental policy/ no access to information - no

(2) Ineffective Institutions:
- Public is empowered.
- Weak institutional coordination.
- Limited participation in the decision making process.
- Inadequate institutional capacity and enforcement.

(3) Private Sector Implementations:
- Lack of awareness of environmental issues on all levels.
- Lack of a systematic and uniform system for monitoring.

Market Size of Environmental Business

1992
US$ 830-1,150 million
1992
US$ 430 million
and regional projects.

- Investment and technology sharing and cooperation on mutually beneficial international
  trade.

Equally important is to open up the national economy to productive inter-regional trade,

resources base and move on the skills and capability of the human resources.

- Environmentally friendly economic growth which is rapid (5 - 6%), widely shared, and sustainable
  sector. The major task facing Egypt and other countries of the Middle East is to restore a private
  economic growth, poverty reduction and environmentally sustainable.

- Minimizing the trade-offs and developing positive linkages between

Steps Towards Sustainable Development

- 

- 

- 

Addressing the environmental and developmental challenges will require:
Environmental is profitable
Government responsibility of all
Environment is the environment is an integral part

Environment is critical
to the economy

Policy Reform is the key issue
The poor should be protected
Subsidies for all

Driving forces of growth
Private enterprises are new
Energy is limited
Water is scarce

Old and New Concepts for Sustainable Development in Egypt
Economic Restructuring and Adjustment Program (ERSAP)

ERSAP

Main Components:

⇒ Restoring macroeconomic balance
⇒ Removal of subsidies and price controls
⇒ Privatization
⇒ Liberalization of foreign trade
⇒ Establishment of the Social Fund for Development (SFD)
⇒ Financial sector reform
ERSAP II

⇒ Macroeconomic stabilization

⇒ Economic liberalization

⇒ Deregulation

⇒ Trade liberalization

⇒ Privatization and public sector reform

⇒ Export enhancement

⇒ Environmental protection
Infant mortality rates have had negative real growth in seven of the last ten years, with the smallest growth in the first year and the largest growth in the third year.

Information on asset growth in agriculture has been greater for

over 60% of all production. The largest area of economic production accounted for

industry, finance and trade, and agriculture out of the three

1991/92

Product Distribution of Final Product, Industrial Sector

(1991/92 current prices, million LE)

Institutional Output by Industry Sector

(1991/92)
## Economic Forecast

<table>
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<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Real GDP growth (%)</td>
<td>2.5</td>
<td>3.5</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>GDP ($ bn)</td>
<td>50.5</td>
<td>52.0</td>
<td>53.9</td>
<td>58.1</td>
</tr>
<tr>
<td>GDP per head ($)</td>
<td>850</td>
<td>857</td>
<td>869</td>
<td>913</td>
</tr>
<tr>
<td>Consumer price inflation (%)</td>
<td>7.3</td>
<td>6.0</td>
<td>6.0</td>
<td>5.5</td>
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<tr>
<td>Exchange rate $/$</td>
<td>3.75</td>
<td>3.90</td>
<td>4.00</td>
<td>4.10</td>
</tr>
<tr>
<td>Merchandise exports ($ bn)</td>
<td>2.8</td>
<td>3.0</td>
<td>3.2</td>
<td>3.5</td>
</tr>
<tr>
<td>Merchandise imports ($ bn)</td>
<td>-9.1</td>
<td>-9.8</td>
<td>-10.5</td>
<td>-11.3</td>
</tr>
<tr>
<td>Trade balance ($ bn)</td>
<td>-6.4</td>
<td>-6.9</td>
<td>-7.3</td>
<td>-7.8</td>
</tr>
<tr>
<td>Current-account balance ($ bn)</td>
<td>1.3</td>
<td>0.3</td>
<td>0.3</td>
<td>-0.2</td>
</tr>
<tr>
<td>Total debt ($ bn)</td>
<td>36.8</td>
<td>36.4</td>
<td>36.2</td>
<td>36.0</td>
</tr>
<tr>
<td>Debt-service ratio (%)</td>
<td>15.9</td>
<td>14.6</td>
<td>13.3</td>
<td>12.4</td>
</tr>
</tbody>
</table>

ANNEX V

IMPLICATIONS OF CLIMATIC CHANGES IN
THE FUKA-MATROUH AREA
IMPLICATIONS OF CLIMATE CHANGE FOR THE

COASTAL AREA OF FUJA–MATROUH
MEMBERS OF TASK TEAM

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Professor of Marine Geology
Coastal Research Institute.

Dr. G.A. EL-MALLAH
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Faculty of Agriculture, University of Alexandria.

Dr. A.M. FANOS
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dynamics and Coastal Eng.
Coastal Research Institute

Dr. A.M. FATHI
Vice Dean and Professor of Soil
Physics and Water Management
Faculty of Agriculture,
University of Alexandria.

Dr. M.T. HASHEM
Professor National Institute
and Fisheries

Dr. A.E. MEHANNA
General Director of Research
Meteorology Authority

Dr. S.E. RAMADAN
National Institute of
Oceanography and Fisheries

Coordinator

Lithosphere, Geology

Populations and Settlements


Lithosphere, Soils
Hydrosphere, Agriculture.

Managed Ecosystem and Fisheries.

Climate and Atmosphere

Marine Ecosystem and Freshwater
IMPLICATIONS OF CLIMATE CHANGE FOR THE COASTAL AREA OF FUKA-MATROUH

A.A.Khafagy
Institute of Coastal Research, 15 Pharaana St.,
El-Shallalat, 21514 Alexandria, Egypt

INTRODUCTION

Towards the end of the last decade it became almost accepted, that the concentration of greenhouse gases would affect the pattern and the balance of the solar radiation in the atmosphere to an extent that a rise in the global mean surface air temperature would take place in the next century. Consequently, the Second World Climate Conference, held in Geneva in 1990, has highlighted the long-term implications of climate change which were considered as major scientific, environmental socio-economic and political challenges. The conference consensus has put the expected global warming change in a range between 2 °C and 5 °C over the next century, if no effective action is taken to reduce gas emissions in the atmosphere. This would lead to a sea level rise estimated to be as much as 65± 35cm. With such alarming figures, many international and regional associations and organizations have set to work to establish an assessment for the possible impacts of the climate change and to explore ways and means to face it at the right timing.

The Mediterranean Action Plan of UNEP was one of the leading organizations to account for this threat and to guide and encourage the execution of several case studies within the Mediterranean basin. One of these studies is the present one, made on Fuka-Matroh region of Egypt. The study programme for this area was planned to cover the climate, the geology, the hydrology, the ecosystem and the socio-economic aspects. Accordingly, a task team of experts was formed which match these disciplines in order to establish a framework for sound environmental management policy based on sustainable resource development and efficient land-use for the Fuka-Matroh region.

AREA OF STUDY

The terrestrial part of Fuka-Matroh study area is almost square in shape. It extends for about 72 km along the Mediterranean coast between longitudes 27° 55' and 27° 10'. (Fig. 1). It is located in the middle of the northern part of Matrouh Governorate, with an average width of about 70 km southward from the Mediterranean shoreline, till the elevated southern plateau (Fig. 1). The area is considered to be a virgin area with almost no major industrial activity in the time-being. So, it forms a good pilot study area for the north-western coastal zone of Egypt and which will become soon at the top of the country development agenda.
PRESENT SITUATION

The climatic condition of the study area ranges between a semi-Mediterranean in the North along the coastal plain, to "arid" in the southern part. The summer season is warm and dry, with absolute maximum temperature around 35 °C and average maximum temperature of about 24 °C, against absolute minimum and average minimum temperature of 5 °C and 15 °C in winter, with about 19.3 °C as overall annual temperature average. The average annual rainfall is around 140 mm in the North and decreases rapidly southward. The rain falls during winter from mid-October to mid-March. The average relative humidity is about 70 percent during summer and could sometimes reach 90 percent while it decreases to about 50 percent during spring.

The study area is characterized by certain topographical and physiological features. The sediments are derived from highly calcareous parent material (Fig. 2). The area can be divided into 3 main zones (Figs 3 and 4):

1. recent coastal zone, which includes the coastal plains and consisting of various strips of different type formations and ranging between 1-6 km wide and extends up to a level of 60 m high above sea level. Beaches, coastal dunes and ridges are the main strips of the area,
2. northern plateau; which is gently sloping plateau with shallow wadis and alluvial sediments of 10-13 km wide and 30-80 m in height, and
3. southern plateau; which extends to 60 km southward with elevation between 80-120 m.

Grazing and cultivation are the main income source of the natives. The cultivated land which constitutes 3.2 percent of the total land area is about 40,000 feddans and distributed between figs, olive, barley and wheat. Agriculture depends mainly on winter rainfall, whose total annual quantities vary from 350x10^6 to 400x10^6 m^3, from which about 33 x 10^6 m^3 is used for agricultural purposes. This water is harvested through a group of cisterns, dykes and sawani constructions. Some limited underground water is also used for human, agricultural and animal consumption. Figure 5 shows the agricultural areas distribution.

There is a relatively high number of mammals, birds, tables 1 and 2, and reptiles which occur in the coastal belt. The rainfall, (Fig.6), and moisture nurture the rich natural vegetation of the western coast. The estimated annual amount of fish catch landed at Matrouh between the years 1985 and 1992 varies between 211 and 758 tons, table 3. The suitable temperature and the abundance of solid substrate favour the growth of sponges. The mean number of sponge ranges between 52.42 and 64.49 individuals/km^2.

The present total population of the study area amounts to about 49,000 mainly concentrated in the coastal zone with average population density of about 12 person/km^2. This density is against a figure of less than one per km^2 in the Governorate of Matrouh as a whole. The average annual growth rate is about 3.2 percent of which 10 percent is due to migration. Figure 7 shows the breakdown of the economic activity on the area.
Fig. 2: Schematic Cross Section from Mediterranean to Quattara Depression.
Fig. 3: Physiographic Zones of Ras El-Hekma Area.
Fig. 4: Topographic Map Showing the Elevations Between Fuka and Matrouh.
<table>
<thead>
<tr>
<th>Mammals Recorded by Osborn &amp; Helmy (1980) in the Coastal Belt Between Alexandria and El-Sallum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hemichinus auritus libycus</strong> (Ehrenberg, 1833)</td>
</tr>
<tr>
<td><strong>Paraechinus deserti deserti</strong> (Loche, 1858)</td>
</tr>
<tr>
<td><strong>Croidura suaveolens matriensis</strong> Setzer, 1960</td>
</tr>
<tr>
<td>This subspecies is endemic to the west Egyptian coast. Mersa Matrouh is so far the only locality where it has been found. It bears the name of Mersa Matrouh (Kasperek, 1993)</td>
</tr>
<tr>
<td><strong>Lepus capensis rothschildi</strong> (De Winton, 1902)</td>
</tr>
<tr>
<td><strong>Gerbillus perpallidus</strong> Setzer, 1958</td>
</tr>
<tr>
<td>This species is endemic to Egypt's north-western desert (Baha El-din, undated)</td>
</tr>
<tr>
<td><strong>Gerbillus andersoni inflatus</strong> (Ranck, 1968)</td>
</tr>
<tr>
<td><strong>Gerbillus gerbillus gerbillus</strong> (Olivier, 1801)</td>
</tr>
<tr>
<td><strong>Dipodillus campestris wassili</strong> (Setzer, 1958)</td>
</tr>
<tr>
<td><strong>Dipodillus simoni kaiseri</strong> (Setzer, 1958)</td>
</tr>
<tr>
<td><strong>Dipodillus amoenus amoenus</strong> De Winton, 1902</td>
</tr>
<tr>
<td><strong>Dipodillus henleyi henleyi</strong> De Winton, 1903</td>
</tr>
<tr>
<td><strong>Mariones shaw iisis</strong> (Thomas, 1919)</td>
</tr>
<tr>
<td><strong>Pachyromys duparsi natronensis</strong> De Winton, 1903</td>
</tr>
<tr>
<td><strong>Psammomys obesus obesus</strong> Cretzschmar, 1828</td>
</tr>
<tr>
<td><strong>Spalax ehrenbergi aegyptiacus</strong> (Nehring, 1898)</td>
</tr>
<tr>
<td><strong>Rattus rattus</strong> (Linnaeus, 1758)</td>
</tr>
<tr>
<td><strong>Mus musculus praeextus</strong> (Brants, 1827)</td>
</tr>
<tr>
<td><strong>Eliomys quercinus cyrenicus</strong> (Festa, 1921)</td>
</tr>
<tr>
<td><strong>Allacata tetradactylus</strong> (Lichtenstein, 1823)</td>
</tr>
<tr>
<td><strong>Jaculus orientalis orientalis</strong> Erxleben, 1777</td>
</tr>
<tr>
<td><strong>Jaculus jaculus</strong> Setzer, 1955</td>
</tr>
<tr>
<td><strong>Canis aureus lupaster</strong> (Hemprich and Ehrenberg, 1833)</td>
</tr>
<tr>
<td><strong>Vulpes vulpes aegyptiaca</strong> Setzer, 1919</td>
</tr>
<tr>
<td>Foxes were recorded in the sand dunes and limestone ridges several times and also fox tracks were seen at a number of localities (Kasperek, 1993)</td>
</tr>
<tr>
<td><strong>Poecilictis libyca libyca</strong> (Hemprich and Ehrenberg, 1833)</td>
</tr>
<tr>
<td><strong>Herpestes ichneumon ichneumon</strong> (Linnaeus, 1758)</td>
</tr>
<tr>
<td><strong>Felis chaus nilotica</strong> De Winton, 1898</td>
</tr>
<tr>
<td><strong>Acinonyx jubatus</strong> Setzer, 1776</td>
</tr>
<tr>
<td>The most recent record is from 1954 (Kasperek, 1993)</td>
</tr>
</tbody>
</table>
Table 2

Birds Recorded in the Area Between Fuka and Matrouh and Their Status Within Egypt

Abbreviations:

CB  casual breeder
MB  migrant breeder
RB  resident breeder
AC  accidental visitor or vagrant (up to and including five documented records for the country)
PV  passage visitor
WV  winter visitor

( ) abbreviation in parenthesis is used to indicate that the status is variable or irregular, e.g.
PV means "irregular passage visitor"

? status uncertain, e.g. RB? means "doubtful resident breeder"
O possible breeding in the area Fuka-Matrouh
* probable breeding in the area Fuka-Matrouh
+ definite breeding in the area Fuka-Matrouh

(extracted from Goodman & Meininger, 1989)

| Species               | RB | PV | WV |  *
|-----------------------|----|----|----|---
| Falco tinnunculus     |    |    |    |   
| Falco biarmicus       |    |    |    |   
| Alectoris barbara     |    |    |  * |   
| Chlamydotis undulata  |    |    |  * |   
| Burbinus oedicnemus   |    |    |    |   
| Cursorius cursor      |    |    |    |   
| Charadrius alexandrinus |  |    |    |   
| Charadrius leschenaultii | PV | WV | CB? |
| Charadrius morinellus | WV |    |    |   
| Calidris alba         | PV | WV |    |   
| Limosa lapponica      | PV | WV |    |   
| Numenius tenuirostris | (PV) | (WV) |    |   
| Numenius arquata      | PV | WV |    |   
| Tringa totanus        | PV | WV |    |   
| Tringa ochropus       | PV | WV |    |   
| Tringa glareola       | PV | WV |    |   
| Actitis hypoleucus    | PV | WV |    |   
| Arenona interpres     | PV | WV |    |   
| Stercoranus pomarinus | PV | WV |    |   
| Stercorarius parasiticus | PV | WV |    |   
| Larus fuscus          | PV | WV |    |   
| Larus cachinnans      | RB | WV |    |   
| Sterna caspia         | RB | PV | WV |   
| Sterna hirundo        |    |    | PV |   
| Sterna albifrons      | MB | PV |    |   
| Pterocles coronatus   | RB |    |    |   
| Columba livia livia   | RB |    |    |   
| Tyto alba             | RB |    |    |   
| Athene noctua         | RB |    |    |   
| Asio flammeus         | PV | WV |    |   
| Apus pallidus         | RB | MB | PV |   
| Alcedo atthis         | CB? | WV |    |   

[Image with two black dots]
<table>
<thead>
<tr>
<th>Species</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coracias garrulus</td>
<td>PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ammomanes cincturus</td>
<td>RB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alaemon alaudipes</td>
<td>RB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chersophilus duponti</td>
<td>RB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melamocorypha calandra</td>
<td>WV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calandra rufescens</td>
<td>RB</td>
<td>WV</td>
<td>O</td>
</tr>
<tr>
<td>Galerida cristata</td>
<td>RB</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Lullula arborea</td>
<td>WV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eremophila bilopha</td>
<td>RB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthus campestris</td>
<td>PV</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Molacia flav a pygnaea</td>
<td>RB</td>
<td>WV</td>
<td>O</td>
</tr>
<tr>
<td>Prunella modularis</td>
<td>WV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carcrotichas galactotes</td>
<td>MB</td>
<td>PV</td>
<td>(WV)</td>
</tr>
<tr>
<td>Enthecus rubecula</td>
<td>WV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Luscinia svecica</td>
<td>PV</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Phoenicurus ochrurus</td>
<td>PV</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Phoenicurus phoenicurus</td>
<td>PV</td>
<td>(WV)</td>
<td></td>
</tr>
<tr>
<td>Saxicola torquata</td>
<td>PV</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Oenanthe isabeliina</td>
<td>PV</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Oenanthe oenanthe</td>
<td>PV</td>
<td>(WV)</td>
<td></td>
</tr>
<tr>
<td>Oenanthe hispanica</td>
<td>PV</td>
<td>(WV)</td>
<td>MB?</td>
</tr>
<tr>
<td>Oenanthe deserti</td>
<td>RB</td>
<td>PV</td>
<td>WV</td>
</tr>
<tr>
<td>Oenanthe moesta</td>
<td>RB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oenanthe lugens</td>
<td>RB</td>
<td>(WV)</td>
<td>O</td>
</tr>
<tr>
<td>Oenanthe monacha</td>
<td>RB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turdus philomelos</td>
<td>WV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sylvia nisoria</td>
<td>PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sylvia communis</td>
<td>PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phylloscopus sibilatrix</td>
<td>PV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phylloscopus collybita</td>
<td>PV</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Muscicapa striata</td>
<td>PV</td>
<td>(WV)</td>
<td></td>
</tr>
<tr>
<td>Picidae parva</td>
<td>PV</td>
<td>(WV)</td>
<td></td>
</tr>
<tr>
<td>Lanus colluno</td>
<td>PV</td>
<td>(WV)</td>
<td></td>
</tr>
<tr>
<td>Lanius excubitor</td>
<td>RB</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Corvus corax</td>
<td>RB</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Sturnus vulgaris</td>
<td>WV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Passer domesticus</td>
<td>RB</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Fringilla coelebs</td>
<td>WV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serinus serinus</td>
<td>RB?</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Carduelis chloris</td>
<td>RB</td>
<td>WV</td>
<td></td>
</tr>
<tr>
<td>Carduelis carduelis</td>
<td>RB</td>
<td>WV</td>
<td></td>
</tr>
</tbody>
</table>
Table 3

Official Statistical Data of Fish Yield at Matrouh Governorate During the Last Few Years
(- = no data)

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Fish yield (ton)</th>
<th>Aquaculture (ton)</th>
<th>Sea fishing (ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1983</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1984</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>1985</td>
<td>304</td>
<td>304</td>
<td>-</td>
</tr>
<tr>
<td>1986</td>
<td>355</td>
<td>355</td>
<td>-</td>
</tr>
<tr>
<td>1987</td>
<td>304</td>
<td>304</td>
<td>-</td>
</tr>
<tr>
<td>1988</td>
<td>626</td>
<td>304</td>
<td>322</td>
</tr>
<tr>
<td>1989</td>
<td>211</td>
<td>75</td>
<td>136</td>
</tr>
<tr>
<td>1990</td>
<td>758</td>
<td>287</td>
<td>471</td>
</tr>
<tr>
<td>1991</td>
<td>497</td>
<td>238</td>
<td>260</td>
</tr>
<tr>
<td>1992</td>
<td>335</td>
<td>-</td>
<td>335</td>
</tr>
</tbody>
</table>

However, the mostly caught pelagic fish of the Fuka-Matrouh area are the following:

- Sardinella sp.  sardine
- Trachurus sp.  horse mackerel
- Seriola dumerili  amberjack
- Sphyraena sp.  sea pike

On the other hand, the rocky bottom in Matrouh area is a suitable living place for a relatively rich fauna of demersal fish. This provides a good possibility for a profitable coastal fishery. The most important demersal fish are the following:

**Bony fish**
- Epinephalus ssp.  groupers
- Serranus sp.  sea bass
- Parnus sp.  common sea bream
- Pagellus sp.  red sea bream
- Lithognathus sp.  striped sea bream
- Diploides sp.  two banded bream
- Chrysophorus auratus  gilt-head bream
- Dentex dentex  dentex
- Maena smaris  picarel
- Synodus sp.  lizard fish
- Mullus sp.  hake
- Merluccius sp.  croaker
- Umbrofield sp.  croaker

**Cartilaginous fish**
- Myliobatus sp.  eagle ray
- Raia sp.  ray

**Mollusca**
- Sepia sp.  cuttlefish
- Octopus sp.  octopus
Fig. 5: Agriculture Zones Fuka - Matrouh.
Construction and Buildings = 5.2 %
Services Sectors = 5 %
Manufacturing Industries / Electricity = 0.9 %

71.3 % Agriculture Grazing and Fishing

Distribution Sectors 17.6 %

Fig. 7: Breakdown of Employment on the Economic Activity Sectors.
The area is served by reasonable transport facilities, (Fig.8) the important ones being the Alexandria-Sallum highway, the Alexandria-Matrouh railway, the single way of Sallum-Alexandria-Cairo desert road and a group of unpaved roads.

CLIMATE CHANGE AND SEA LEVEL RISE

The scenarios of the global climate change, adopted in the present study are based on the work of Wigley and Rapper (1992) which takes into consideration, among others, the effect of sulphates and stratospheric ozone depletion. Two temporal horizons are considered in the study; i.e. the years 2030 and 2100, while the conditions in the year 1990 are taken as base line for comparison.

For 1°C global warming, the changes at the north-western coast of Egypt between Fuka and Matrouh would be as shown in table No. 4. (University of East Anglia Report, Nov. 1993).

Table No. 4: Seasonal and Yearly Temperature and Precipitation

<table>
<thead>
<tr>
<th>Season</th>
<th>Temperature</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual</td>
<td>0.8 to 0.9 °C</td>
<td>0 to -4 %</td>
</tr>
<tr>
<td>Winter</td>
<td>0.7 to 0.9 °C</td>
<td>-5 to -22%</td>
</tr>
<tr>
<td>Spring</td>
<td>0.7 to 0.9 °C</td>
<td>8 to 26%</td>
</tr>
<tr>
<td>Summer</td>
<td>1.0 to 1.1 °C</td>
<td>no rainfall</td>
</tr>
<tr>
<td>Autumn</td>
<td>0.7 to 0.8 °C</td>
<td>0 to -14%</td>
</tr>
</tbody>
</table>

The operative scenarios of temperature, precipitation and sea level rise for time horizons 2030 and 2100 for Fuka-Matrouh region would be as shown in table no. 5.
Fig. 8: Network of Transport Facilities.
Table No. 5. Operative Scenarios of Temperature, Precipitation and Sea Level Rise

<table>
<thead>
<tr>
<th></th>
<th>Time Horizon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2030</td>
</tr>
<tr>
<td>Annual</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0.7 to 0.8 °C</td>
</tr>
<tr>
<td>Precipitation</td>
<td>0 to -4%</td>
</tr>
<tr>
<td>Winter</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0.6 to 0.8 °C</td>
</tr>
<tr>
<td>Precipitation</td>
<td>-5 to -20%</td>
</tr>
<tr>
<td>Spring</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0.6 to 0.8 °C</td>
</tr>
<tr>
<td>Precipitation</td>
<td>7 to 23%</td>
</tr>
<tr>
<td>Summer</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0.9 to 1.0 °C</td>
</tr>
<tr>
<td>Precipitation</td>
<td>no rainfall</td>
</tr>
<tr>
<td>Autumn</td>
<td></td>
</tr>
<tr>
<td>Temperature</td>
<td>0.6 to 0.7 °C</td>
</tr>
<tr>
<td>Precipitation</td>
<td>0 to -13%</td>
</tr>
<tr>
<td>Sea Level Change</td>
<td>16 cm</td>
</tr>
</tbody>
</table>

The time horizons 2030 and 2100 show an increase in temperature in all seasons from 0.6 to 1.0 °C and from 0.5 to 2.8 °C, respectively. The change is expected to be greater in summer. The annual precipitation shows a decrease of 0–4 percent for the year 2030 and 0–10 percent for the year 2100.

The rise of the mean sea level in the coming century, due to global warming, would be a substantial increase over the local rise that has taken place during the present century along the Mediterranean coast of Egypt. Several scenarios have been suggested to predict the rate of sea level rise in coming decades. The best-guess scenario, used in this study, is based on the work of Wigley and Raper (1992) which yields a rise of 16 cm by 2030 and 48 cm by 2100.
MAIN IMPACTS OF CLIMATE CHANGE

The present document reports on the results of a performed investigation into the potential impacts of the climate change including the sea level rise effects. The aim is to assess the impacts which the variation of the climate and the rising sea level may cause on each domain; ecosystem and human activities. The possible impacts were described qualitatively and wherever possible quantitatively, as well.

The most important climate change would be the northward shift of winter cyclonic patterns affecting the western Mediterranean coast in winter. There might be a decrease of cyclonic activity, more erratic rainfall, drier summers and higher evapotranspiration. Moreover, the increase in the length of the summer and the decrease of winter precipitation may lead to extension of summer aridity.

Due to rising sea level, the eastern part of the project area would be subjected to some coastal erosion and flooding of backshore areas and depressions. Whereas slight impacts are expected to take place at the western part owing to presence of wave-cut cliffs. As an estimation, the shoreline of Fuka-Matrouh would be retreated between 2 to 5 km² with capital losses of 454 and 1512 MLE by the years 2030 and 2100, respectively. In fact, the coastal ridges surrounding the coast at some stretches will partly play an effective role in stopping flooding and damage to the coast.

Small pocket beaches and small bays will be the first to experience the impact of a gradual rise in sea level. The instability and breakup of barrier islands could become frequent in the coming decades. Beaches in front of these barriers could be subjected to accelerated erosion. Low sandy coasts at the east would adapt to sea level rise as they have the capacity to reform themselves with the rising sea level by gradual migrating landwards.

A consequence of rising sea level would also be an increase in the occurrence of extreme events, like severe storms, waves, currents and high tides. Wind-generated wave heights can increase by 7.5 percent.

Increase of temperature is not expected to have an appreciable effect on the decomposition of organic matters in soils. Increase of air temperature will change the soil thermal regime. Higher temperature will reduce soil moisture and thus increase soil/wind
erosion, and soil salinity, while soil fertility would be decreased. Hence, it would accelerate land desertification.

The increase of rainfall by 2030 during spring seasons will be very low and of insignificant effect on runoff. Nevertheless, the winter rainfall decrease would cause a reduced ground water recharge and thus less thickness of fresh water layer in the pluvial ground water aquifers is expected. Therefore, the amount of potable water may become not sufficient for people and animals.

Due to the rise in annual temperature and decrease in precipitation, the nature flora of the inland may shift northwards. The flora of the present inter-dunal depressions may expand at the expense of the original endemic flora.

The decline in precipitation and increase in temperature may also lead to a shriveling in vegetation cover and hence decreasing the food available for herbivorous mammals and in turn decreasing their population and consequently the population of carnivorous mammal, too.

Global warming may alter the migration rhythm of the wintering migratory birds. The reptile community in the area may also undergo some alterations. The higher temperature may increase the probability of the appearance of jelly fish swarms in coastal waters, and in addition due to the higher salinity, may urge the lesswegian immigrants to inhabit the area.

Rainfall decrease and temperature increase will affect the pattern of cultivated crops. Change in rainfall and increase in evaportranspiration may lead to a reduction in the cultivated areas and agriculture is likely to change towards more intensive farms. A change in crop productions and decrease in soil productivity are expected. Some tropical and subtropical plant diseases will move northwards and the distribution of insects and pests will be altered.

The impact of temperature increase could be significant in important fish species. Migration pattern of pelagic fish, as well as their spawning area, could be changed.
Marine grass meadows are particularly sensitive to reduced water transparency. So they may be affected as a result of the increase of sediment loads in the water, as expected due to rising sea level. On the other hand, a rise in water temperature may be in the favour of sea grass meadows.

Temperature rise will increase energy demand for summer resorts services, e.g., air conditioning. More demand for energy is expected for the development in the regular industry sector and for the expanding touristic sector.

Temperature increase may also favour the consumption of beverage and may encourage their production in the area.

A relatively serious problem may be endangering the safety of some of the historical remains located in the area due to the rise in water table elevation.

Climate and subsoil water level change may affect the existing infrastructure of the area which would call for more upgradings.

Climate change will result in rapid corrosion of potable water supply pipes. Increased temperature will speed up the rate of anaerobic decomposition of the organic matter in the sewage system which may lead to dangerous levels of methane build-up and risk of explosion.

MEASURES TO ELIMINATE, REDUCE, MITIGATE AND ADAPT TO THE PREDICTED EFFECTS

The following measures are proposed to limit greenhouse gas emissions and to avoid, mitigate and/or adapt to the predicted effects:

1. improving energy efficiency to reduce its demand and using cleaner energy sources to reduce CO₂ emissions. Solar, wind and wave energy can be used as clean energy source,
2. preparing designs of coastal protection measures for critical sites. Regarding the coastal dunes, suitable stabilisation methods (by using plants, wood fences, and
stabilization by spraying,) should be undertaken to protect the foredunes and coastal
dunes which act as natural barriers against sea attack,
3. controlling the underground water exploitation to avoid salt water intrusion in coastal
areas,
4. gradual landward transfer of the tourism projects which are already located at critical
sites. The existing Environment Protection law has to be strictly implemented which
stipulates leaving a distance of 200 m between the shore line and any construction,
5. carry out extensive programs to upgrade awareness of water users with the scarcity
of fresh water resources and to introduce cultural practices for water conservation,
6. adopting well defined concept for land use based on expected changes in natural
resources,
7. select suitable draught tolerant crops, shrubs and forage plants to maximize the yield
and to minimize adverse impacts,
8. the laws protecting the wildlife have to be strictly implemented,
9. improve the knowledge in the field of fisheries as aquaculture research is currently
inadequate to encourage and to invest research in these fields,
10. Matrouh airport terminal has to be upgraded to cope with the increase of the
number of tourists and investors activities
associated with the new developments,
11. the whole infrastructure has to be improved starting with local roads that should
be widened and paved and the railway line should be upgraded, and
12. adoption of new safety elevations for drainage and sewerage systems.

SUGGESTION TO FOLLOW UP THE PRESENT STUDY
1. Constructing and operating a field station at the study area for data collection,
   surveying and data analysis.
3. Developing and enhancing mathematical models to predict the impacts on the area.
4. Preparing the best coastal protection plan according to integrated coastal zone
   management concept.
5. Evaluation of the coastal lands for various land use.
ملخص
تثبيت التغيرات المناخية على المنطقة الساحلية مابين فوكا ومطروح

يتضمن برنامج دراسة المنطقة الساحلية مابين فوكا ومطروح اجراء تقييم لضمان الراهن من حيث النشاطات والأنظمة الماردنة والممارسات البيئية بالإضاطرابات إلى الخدمات السياحية والвлажнة بالموقع، كما شمل عملية تقييم لتأثير التغيرات المناخية العالمية على المنطقة من حيث التربة واللحاء، وكذلك الاقتراحات المحتملة التي يجب اتخاذها لجذب هذه التغييرات أو تقليل أثارها مع التوجيه بما يجد تأباهًا أزاء

الوضع الراهن.

تغطي الدراسة المنطقة الساحلية مابين فوكا ومطروح بطول يقرب من 3 كم على ساحل البحر المتوسط وبعمق 20 كم جنوباً، ويبلغ تعداد السكان المنطقة مايقارب 45 ألف نسمة ويستخدم معظم السكان المنطقة (23%) بالجزء الساحلي، وترتبط منطقة الدراسة بباقي مدن الجمهورية بطرق وسائل النقل منها الطريق الساحلي الدولي السريع وخط رقم الحديدي وعدد طرق فرعية أخرى.

ويعتبر المطار المصرف الرئيسي للمياه بالمنطقة حيث يبلغ متوسط كمية ما يقارب من 300 - 400 مليون متر مكعب يخصص معظمها في فصل الشؤون وتقلل هذا الامطار في الوجه الباخر، ويتم الاستفادة من المياه عن طريق اقامة خزانات ومجموعة محليات بواسطة السكان الداخلي، ويعتبر الزراعة وال рыб الهدف المصرف الرئيسي للدخ بالمنطقة حيث تبلغ المساحة المنزوعة حوالي 1000 فدان وهو ما يعادل حوالي 9 من المساحة الكلية لمنطقة الدراسة يتركز معظمها في الوديان حيث تتم زراعة اشجار القرن والزيركون والوز إلى جانب القمح والشعير.

وبالرجوع إلى بيانات التغيرات المناخية والارتفاعات المتوقعة في مستوى سطح البحر خلال القرن القادم تتبنى إن لم يزيد من الارتفاعات سلويًا متوازنة في درجة الحرارة تتراوح مابين 2-3 درجة مئوية بحلول عام 2050، مما يرمز إلى أنه من المتوقع أن تقلل نسبة الامطار السنوية على النحو الذي يترتب عليه انخفاض نقطة الترجمة وتراجع مستوى البحر بقائمة 10 سم و8 سم في نفس الأجنحة المثبته من الثوابت التي تؤدي التغيرات المناخية إلى تحرك نظام الطابعات المؤثرات على المنطقة انخفض معدل الامطار وزيدت زراعة البحر بقائمة 15 طم و8 طم في نفس الأجنحة المثبته الحالة من ترجمة مستوى البحر إلى تناقل النجاحاتها، ومن المتوقع أن يترتفع مستوى البحر بقائمة 5 - 10 كم بحلول نهاية القرن القادم، كما أن الشريحة الساحلية ومايحتوي من مشتقات قد يثير ترقب إلى مخاطر الفرق الموسمية بجمع البحر خلال الشهرين الأولى اواخر فصل صيفي بدرجة حرارة تصل إلى 20 درجة مئوية ما يثير التحري من تقلبات في تغطية النباتات للموقع، وتفاقم الامراض النباتية ما يؤدي إلى الخلافات الناجية في الغذاء، كما أن تغطية النبات الطبيعي بسواك
يرجى شمال متابعة عن تغير محاور الرعي وتقسيمها الأمر الذي يكره
على هجرة السكان.

ومن المتوقع أيضًا أن تؤدي التغيرات المناخية إلى التأثير على
مخطط هجرة طيور الشمال إلى سواحل منطقة الدراسة خلال فصل الشتاء،
وإلى جنوب المنطقة تعتبر في كل من مخطط هجرة الأسماك وحياتها الزواحف
كما ان jelly fish swarms
الإرضية واحتلال زيادة إعداد الالمانيات
الزاحفة في المنطقة.

كما أن ومن المتوقع ان تؤدي زيادة درجة الحرارة إلى تأثير
البيئة الأساسية سلبًا إلى زيادة استهلاك الطاقة مما قد يكون منحنا
على قيام بعض العوامل الخدمية لمواجهة متطلبات تزايد احتياجات
السكان والخدمات السياحية.

وتستنتج الدراسة بعض الخطوات التي يجب اتخاذها لتجنب تلك
التأثيرات أو تقليل أثرها ومن أهمها:

1- استخدام مشار بينية جديدة للطاقة تنخفض بها نسبة المواد الغازية مع
استخدام مشار بينية للطاقة باستخدام قوه الرياح والأمواج
والطاقة الشمسية.

2- تخصيص أعمال حماية الموارد في المناطق الحضرية مع تدكيم
الكبتان الريفي وتكييفها باستخدام الوسائل المناسبة لتكوين
درعًا أمام طغيان مياه البحر خاصة في المناطق مخلّفة المنسوب.

3- الاتصال التدريجي المرشح للمشروعات والقرى السياحية القريبة من
خط الشاطئ إلى جنوب الطريق الدولي السريع لحمايتها من غمر
مياه البحر مستقبلًا.

4- اعداد برامج توعية موسعه لإرشاد المواطنين إلى خص استخدام
المياه بسبت نشرها في المستقبل.

5- اتخاذ محسين زراعي جديد تحميه زيادة نسبة ملوحة التربة في
المستقبل مع الالتزام بالزراعة المكثفة بسبت نقل مساحة الأرض
المزارع.

6- يجب تطبيق قانون حماية البيئة الطبيعي بحزم وكذلك مراوغة
الحفاظ على حرم الشاطئ بحر لا يقل عن 300 متر.

7- تشجيع التدوير في المزارع السماكة بسبب انخفاض الحاجة الأسماك
البحرية في المستقبل.

8- زيادة حركة السياحة.

...
ANNEX VI

INTEGRATED PLANNING AND MANAGEMENT STUDY
FOR THE AREA
INTEGRATION VS. SECTORIAL APPROACH

Sectorial solutions "transfer" the problem

Managing complex systems requires integrated approach which can:

- bring together multiple and overlapping interests of the coastal area;

- harness coastal resources for maximum social and economic benefit for present and future generations;

- bring together sectorial activities;

- "internalize" problems and conflicts.
DEFINITION OF ICAM

Adaptive process of resource management for environmentally sustainable development of coastal areas.

ICAM is not a substitute for sectorial planning but focuses on the linkages between sectorial activities.
ICAM REQUIRES

❖ A MULTIDISCIPLINARY APPROACH
❖ PROBLEM SOLVING AND NOT PROBLEM TRANSFER
❖ PRIORITY TO PREVENTION RATHER THAN CURE
❖ A PRECAUTIONARY APPROACH

TYPES OF INTEGRATION:
❖ among sectors
❖ among institutions
❖ among plans
❖ vertical/horizontal
<table>
<thead>
<tr>
<th>Activities &amp; Effects</th>
<th>Urbanization</th>
<th>Tourism</th>
<th>Industry</th>
<th>Energy Production &amp; Aquaculture</th>
<th>Transport</th>
<th>Agriculture</th>
<th>Possible Preventive Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marine Pollution</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Adequate facilities of effluent Collection and treatment. Restrictions on non-point sources</td>
</tr>
<tr>
<td>Freshwater Pollution</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>As above and protection of water catchment areas Prevention of overpumping</td>
</tr>
<tr>
<td>Air Pollution</td>
<td>↑</td>
<td></td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Pollution abatement equipment Restrictions on fuels burned. Encouragement of public transport</td>
</tr>
<tr>
<td>Loss of marine resources</td>
<td>↑</td>
<td></td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Management of fisheries Designation of marine reserves Restrictions on extraction Encourage natural beach processes</td>
</tr>
<tr>
<td>Loss of land resources</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Designation of protected areas Protect open spaces Rehabilitate damaged open spaces Keep spatial options open</td>
</tr>
<tr>
<td>Loss of cultural resources</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Designation of sites, buildings &amp; monuments Encouragement of new, compatible uses Restrictions on building height &amp; materials Rehabilitation of stone damage &amp; b' corrosion</td>
</tr>
<tr>
<td>Loss of public access</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Regulations to guarantee public right of access Prevention of obstacles to access Clear definition of public and private rights to resources</td>
</tr>
<tr>
<td>Soil degradation</td>
<td>↑</td>
<td>↑</td>
<td></td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Teflon abatement equipment Cultivated farming practice to prevent soil erosion</td>
</tr>
<tr>
<td>Noise and congestion</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>↑</td>
<td>Noise abatement equipment at source Acoustic building and acoustic barriers Restrictions on locations of noise sensitive activities</td>
</tr>
</tbody>
</table>

Table 1. MATRIX OF POSSIBLE INTERACTIONS BETWEEN ECONOMIC ACTIVITIES AND EFFECTS ON COASTAL RESOURCES
CONFLICTS

Typical conflicts occur over:

- proximity to the coastline
- incompatible uses
- right of access to the shoreline
- conservation vs. immediate economic gains
- adequate provision of environmental services, etc.
EFFECTS OF ECONOMIC ACTIVITIES ON COASTAL RESOURCES

marine pollution
freshwater pollution
air pollution
loss of maritime resources
loss of land resources and visual value
loss of historical and archeological resources
loss of public access to the beach
noise and congestion
climatic changes
risks and hazards
WHAT IS COASTAL AREA?

- AREA OF INTENSE ACTIVITY
- AREA OF INTERCHANGE WITHIN AND BETWEEN PHYSICAL, BIOLOGICAL, SOCIAL, CULTURAL, ECONOMIC ETC. PROCESSES
- AREA COMPOSED OF MULTIPLE INTERACTING SYSTEMS (MARITIME, TERRESTRIAL, RIVERINE)
- ECOLOGICALLY SENSITIVE AREA: CHANGES GENERATE CHAIN REACTIONS
- AREA WHICH ATTRACT POPULATION FASTER THAN INLAND AREAS
HOW TO DEFINE THE COASTAL AREA?

PARTS OF THE COASTAL AREA
Source: California Coastal Zone Conservation Commissions (1975)

ECOSYSTEMS APPROACH

LONGITUDINAL/PERPENDICULAR AXES
WHAT IS COASTAL AREA?

COASTAL

SEA-LAND INTERFACE

COASTAL ZONE

- LAND AFFECTED BY ITS PROXIMITY TO THE SEA AND THAT PART OF THE SEA WHICH IS AFFECTED BY THE PROXIMITY OF THE LAND

- GEOGRAPHICALLY NARROW AREA

- PROBLEMS FELT IN THE COASTAL ZONE ARE THE CONSEQUENCE OF THE INTENSIVE USE OF PHYSICAL SPACE AND NATURAL RESOURCES

COASTAL AREA

- TRANSITIONAL AREA/ENVIRONMENT BETWEEN THE OCEANS AND TERRESTRIAL DOMAINS

- MANY DEVELOPMENT PROCESSES TAKE PLACE ACROSS THE WHOLE AREA

- GEOGRAPHICALLY BROADER AREA WHICH INCLUDES COASTAL ZONE, LARGE ECOSYSTEMS, TERRITORIAL WATERS (12 NM), AND EEZ (200 NM)

- MANY PROBLEMS ORIGINATING IN THAT AREA AFFECT THE PROCESSES AND ECOSYSTEMS OF THE COASTAL ZONE AND THE SETTLEMENTS LOCATED IN IT
STRATEGIES FOR SUCCESSFUL IMPLEMENTATION OF GIS

- Strong leadership;
- Clear short- and long-term planning;
- Pilot study used;
- Realistic, problem-oriented applications;
- Dedicated and motivated personnel;
- Stable funding;
- Sufficient schedule.

GIS COSTS

- Data - collection and conversion;
- Software - system and applications;
- Personnel - training;
- Hardware - initial and maintenance;
modeling

DATA LAYERS

CRITERIA FOR DETERMINING SUITABILITY

OVERLAY OF FEATURES

NEW DATA RELATIONSHIPS

WEIGHTING THE ATTRIBUTES

SUITABILITY = f(A) + f(B) + f(C) + f(D)

MODEL OF SUITABILITY

Most suitable areas

Nonsuitable areas
the layer concept

- Layer name
- Slope aspect Poly
- Soils Poly
- Streams Line
- Wells Point
- Administrative boundaries Poly
- Archaeological sites Point

- each feature type for an area is stored in a separate coverage
three basic feature types

- geographic features too small to have area become points

  +1  +3
  +2  +4

  wells
  telephone poles
  archaeological sites

- geographic features having length but too narrow to have area become arcs

  1
  2

  streams
  streets
  fault lines

- geographic features having area become polygons

  1
  2

  soils
  land use
  waterbodies
  administrative/political boundaries

- each feature is identified by a unique ID
four major GIS functions

- data capture
  - graphic data: digitized, converted from existing data
  - attribute data: keyed in, loaded from existing data files

- data storage and manipulation
  - file management
  - editing

- data analysis
  - database query
  - spatial analysis
  - modeling

- data display
  - maps
  - reports
what is a geographic information system?

- maps – graphic data
- database – tabular data

Integration of graphic data / tabular data
GIS DEFINITIONS

- A computer system capable of holding and using data describing places on the earth's surface.

- An organized collection of computer hardware, software, data and personnel designed to efficiently capture, store, update, manipulate, analyze and display all forms of geographically referenced data.

BENEFITS OF A GIS

- Improved quality of information;
- Greater and faster access to data and information;
- More efficient information processing;
- Informed decisions;
- Maps, graphics and reports.
CAMP Fuka: Carrying Capacity Assessment Study for Tourism

Tourism in Egypt

Owing to rich attractions of Pharaonic, Christian and Islamic cultures, to Mediterranean and the Red Sea natural values as well as desert attractiveness, Egypt has established itself as a world famous tourist destination. This is why Egypt is certainly a prospective country of tourism in world terms. Moreover, on the level of Government policy, tourism is placed very high in development priorities. Namely, within the global process of transition and privatization, Egypt is one of the few countries which has in recent years tried to attract foreign and local investors in tourism. Stimulation process is developed within the sphere of taxation, tariff, pricing, investment policy and rights of repatriation of profits. Through the Ministry of Tourism, the State has founded Tourism Development Authority (TDA) which is responsible for planning, coordination and promotion of tourism investments.

Project Area

The Project Area, defined by the agreement of MAP and the Egyptian Government, belongs to the Marsa Matrouh Governorate and covers a 100 km long north-west Mediterranean coastal stretch of Egypt. It starts from the city of Marsa Matrouh, includes Fuka situated 210 km to the west of Alexandria and extends towards the east. The depth of the Project Area ranges from 10 to 15 km from the coast.

The whole Project Area is in a pioneer state if tourism development. There are virtually no tourist installations of any importance apart from those in Marsa Matrouh, the Siwa Oasis and newly built tourist settlement in the Sidi Abdel Rahman area. The most of the area is not on the priority programme of the Tourist Development Authority. This is because TDA does not own the land and because the access to the sea is considerably limited. However, various initiatives to build tourist settlements on the most attractive spots of the coast come from private and state companies.

Tourist development scenarios

In the context of the future tourist development three scenarios are possible.

The first one follows linear, uncontrolled and unplanned concept of high building density along the coast. Developers are local government companies and private entrepreneurs, focusing on real estate business.

The second scenario from the point of planning and management satisfies all modern development standards but only on an enclave concept of tourism destination development. It means that everything is brought out of the region and is oriented to create tourism oasis for foreigners. Both, first and second type of tourist development do not contribute enough to the economic, social and cultural advancement of the local population and they are short-term oriented.

Third scenario presupposes a definition of clear objectives and development strategies in order to enable local population to take necessary responsibility in the tourism development process. It is based on the general understanding of tourism as a
multifunctional system development which should be guided by sensitive planning and management methods and techniques.

Findings and proposals

According to the target group-atraction analysis, Project Area is limited in number of tourist products it can offer. It is mainly a routine summer holiday type. It can attract tourists from Europe, the Near East and America mostly for the beauty of the coast but also for the sound sociocultural basis with possibility for special interests which can find places in the hinterland as well (water sports, hunting, excursions,...).

Regarding development scenarios the third one is the only one environmentally and socially sustainable in longer run giving the chance to broadest strata of population to share tourism development benefits. On the other hand this is the most difficult scenario for implementation. To this end, in dealing with complex interconnection of natural and anthropogenic features of the region, preparation of the Integrated Coastal Area Management Plan has been proposed with the Tourism Master Plan as its subdocument. Tourism Master Plan for the Project Area, based on the world relevant criteria, define itself according to available resources and attraction mix of the markets as well as programs and measures on the state, regional and local level. This document with ICAM Plan will attract local and international financial institutions, developers and private investors in the process of tourism development in the tourism development which has already begun. Both documents should prove furthermore, that this region is capable of carrying out the integral development concept which is different from the one preferred in other parts of the country. Good first step in this regard is intended preparation of Carrying Capacity Assessment for Tourism Development following the methodology offered in the relevant Guidelines prepared by PAP/RAC.
Figure 2: CCA as part of the ICM process, integrated plans and tourism development plans.
CCA phases

1. documentation
2. analysis
3. tourism development options
4. CCA formulation

- part of the ICAM process: sectoral activity, linkages, integration with other sectors

- outside ICAM process: tourism master plan, linkages necessary
Table 8. Elements of the carrying capacity in the Mediterranean countries that must be given a special attention due to the specific general and tourism features

<table>
<thead>
<tr>
<th>Element</th>
<th>Reason of its particular importance</th>
<th>Possible negative consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>eco-system</td>
<td>- increased sensitivity due to the specific climate</td>
<td>- disturbance of the natural balance, disappearance of rare wildlife species</td>
</tr>
<tr>
<td>attractive landscapes</td>
<td>- particular sensitivity of the most attractive areas (islands, protected areas)</td>
<td>- damage to the basis of the economy since tourist arrivals are motivated by the quality of the eco-systems</td>
</tr>
<tr>
<td>water supply</td>
<td>- shortage of water in summer; - soil permeability</td>
<td>- threat to the development of tourism, - threat to traditional activities, specially agriculture, - high prices of water</td>
</tr>
<tr>
<td>waste waters</td>
<td>- dry climate of summers - the Mediterranean basin is closed</td>
<td>- further deterioration of the already high level of pollution of the sea and land waters</td>
</tr>
<tr>
<td>traffic</td>
<td>- exaggerated traffic increase in the summer season, - narrow roads, especially in historic settlements; - sensitivity of cultural monuments to air and noise pollution</td>
<td>- traffic congestion; - high levels of air pollution in tourist settlements; - devastation of cultural monuments</td>
</tr>
<tr>
<td>economic issues</td>
<td>- lower degree of economic development than in the countries from which tourists come</td>
<td>- further increase of social differences; - decline of the traditional Mediterranean economy</td>
</tr>
<tr>
<td>cultural and historic heritage</td>
<td>- exceptionally rich cultural and historic heritage, - limited funds for conservation and improvement of the cultural and historic heritage</td>
<td>- devastation of cultural monuments; - diminished appeal of tourist areas due to the threatened historic heritage</td>
</tr>
<tr>
<td>socio-cultural issues</td>
<td>- specific traditional culture and norms of behaviour, - existence of a number of small specific closed communities with preserved local identity</td>
<td>- destruction of local culture; - conflicts between local population and tourists; - increase in criminal activities</td>
</tr>
</tbody>
</table>
Figure 1. Basic groups of parameters important for the carrying capacity assessment.
Carrying capacity concept

- First origins: agricultural studies

- Not only physical capacity of a particular site: maximum number of visitors (case of Rhodes)

- Other parameters: socio-demographic, cultural, political, economic, environmental etc.

Definition:

The maximum number of people that may visit a tourist destination at the same time, without causing destruction of the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of the visitors' satisfaction.
PAP/MAP activities

- Blue Plan scenarios
- carrying capacity assessment guidelines
- studies: Rhodes, Vis, Fuka, Albania
1. MED Agenda 21

- special chapter on tourism
- common to all Mediterranean countries
- concentrated in the North 80%

requirements for harmonious development:
- impact studies
- tourist potential to be assessed in development studies;
- implement ICAM when allocating areas for tourism

2. MAP Phase II

- economically important
- major factor affecting the environment
- environment major factor for tourism

sustainable development objectives:

- assess, monitor and evaluate tourism activities
- promote environmentally friendly tourism
- assess carrying capacity
- raise the awareness of tourists for environment
نيابة عن زملائى العاملين في محطه التخطيط واستغلال الأراضى والمتابعة

البيئة(NUPEM) والعمالين بجامعة الإسكندرية أود أن أشكر مستر/تومبتش ومستر/ راديليا والاستاذ الدكتور/ محمد عز الدين الراعي و أحب أن أوضح لسيادكم الخطرات التي تمت حتى الآن وهي تلخص في أنه يتعاون مع PAPRAC قد تم تنظيم دورتين تدريبيتين كل منهما لساعة أسبوعين على أعمال نظام المعلومات الجغرافية واستخدام برامج ARC/INFO وقد كانت على النحو التالي:

1- الدورة الأولى وقد عقدت بمقر محطة NUPEM والكافت عميى المشرووعات الدولية وتمت في يوليو عام 1994. وقد قام بتألقى الحاضرات السيد توشن راديليا وحضور عدد 6 متدربين منهم ثلاثة من محطة التخطيط ومتدربي كلية الزراعة جامعة الإسكندرية ومدربي من معهد البحوث والدراسات جامعة الإسكندرية ومدربي من جهاز شئون البيئة وقد تركزت الدورة على شرح وتعريف نظام المعلومات الجغرافية وأهميتها واستخدامها في الأغراض المختلفة وكذلك على كيفية ادخال البيانات من الخرائط الطيفي/كتور والمعلومات الأخرى مثل الطرق والibre والمساكن الموجودة على تلك الخرائط وكذلك تم نقل حسب القبائل من خرائط توزيع القبائل الهاسباللى وتم أيضا تدريب العاملين على صيحة الإحاطة الخاصة بنقل المعلومات عن الخرائط إلى الخسابات الهاسب وكذكية تجميع هذه البيانات في ملف واحد

ثم بعد ذلك تم عمل بعض التحليلات البسيطة لتعريف العاملين بأهمية النظام مثل عمل حول الطرق وتحديد أقرب المساكن والإبار إلى الطرق الرئيسية. كما تم تحديد الميول والاختصارات. وفي نهاية الدورة تم طباعة خرائط للقبائل وعليها بعض المعلومات المتاحة مثل الطرق والإبار.

LUPEM - هذا وقد عقدت الدورة الثانية في شهر مايو عام 1995 بنفس مقر محطة وذكى بحضور 4 من العاملين باحثة وثلاثية من العاملين معهد البحوث والدراسات
بجامعة الإسكندرية وكذلك واحد من كلية الزراعة جامعة الإسكندرية وقد بدأت هذه الدورة ب soátراض ماتم خلال الدوره السابقة. وقد تم استكمال عملية نقل الخرائط الفعلية إلى الحاسب الآلي وكذلك تم نقل حروف المجتمعات المحلية التي سيتم العمل عليها في مشروع إدارة موارد مطرود إلى الحاسب الآلي ويتكون كل مجتمع ملحى من عدة قبائل وعير عمان من النتائج.

وكذلك تم تحويل النتائج المتحصل عليها عن طريق برنامج ERDAS وهي عبارة عن نتائج تحليل صور الاقمار الصناعية وتحديد تصنيف الغطاء الأرضي الى نتائج يمكن تحويلها للتعامل معها على برنامج Arc INFO والمما تجميعها عن طريق المسح الميداني وتخزينها على قائمة بيانات خاصة.

وبناء على ذلك فإن البيانات التي تم التعامل معها تنقسم إلى عدة بيانات وهي:

1 - بيانات مجمعة عن طريق المسح الميداني (سكانية)

2 - بيانات مجمعة عن طريق تحليل وتصنيف صور الاقمار الصناعية (تصنيف الغطاء الأرضي)

3 - بيانات نقلت من الخرائط الطبوغرافية (خريط خرائط - طرق - ابار)

هذا وقد تم وضع كل هذه البيانات في طبقات مختلفة (Layers) وتحديد كافة البيانات المتاحة لكل مجتمع ملحى يضم مجتمع قبلي.

ومن هذا يتضح أن من أهم النتائج التي تم الوصول إليها خلال هاتين الدورتين الآتى:

1 - تدريب جميع العاملين على استخدام برنامج نظم المعلومات الجغرافية الحديثه Arc/INFO

2 - بناء نظام معلومات جغرافي يحتوي على البيانات التي تم تجميعها والمتاحه والسابق ذكرها من قلعة فوكه - مطرود RASTER-

3 - إمداد التفسر للعاملين بالإحاطة للتعامل مع مختلف انواع البيانات و مساعد على الحصول على نتائج أكثر دقة من البيانات المتاحة VICTOR

ومن المشاكل التي واجهت العمل في المرحلة السابقة:

1 - اختلاف المتدربين من خارج الخرطح في خلال الدورتين
2- قصر المدة المحددة للدوره لتقابل المطلوب تحقيقه من اهداف

وهماسبق نستطيع ان نحدد ما هو مطلوب استكماله في المرحلة القادمة وتلخيصه في الآتي:

1- استكمال ما تم من أعمال خلال المرحلة السابقة واستكمال بناء نظام المعلومات الجغرافى الذي قد تم بنائه بأضافة البيانات الأخرى والمتاحة مثل بيانات الارصاد الزراعية وبيانات تحليل الأربه.

2- تحليل كافة البيانات المتحصل عليها والحصول على النتائج الخاصة بالإمكانات المستقبليه للتنميه في المنطقة فوكه - مطروح.
ANNEX VII

DEVELOPMENT OF ENVIRONMENTAL LEGISLATIONS
AND INSTITUTIONAL FRAMEWORK
Abstract of
The Legal Study of Environmental
Legislations Relating to
The Fuka Matrouh
Area Project
Counselor
Mohamed Abdel Aziz El-Guindi

The Fuka Matrouh area project plan raises a number of questions concerning the legislative rules which govern its development operations. These rules include:

- 20 international conventions enforced in Egypt including 7 concerning the environment of the Mediterranean Sea.

- Some of the domestic lows and national decrees concerning environment.

Egypt obligations during development of Fuka Matrouh area according to the international conventions:

1. Supervision, inspection and control of all kind of plants for prevention of spreading of disease and pests.

2. Establishment of integral national reserve areas and national parks.

3. To under take the necessary procedures to prevent the transportation and spread of pests and disease of plants and to promote the means of combating them.

4. To under take the necessary procedures for the conservation of fauna and flora species and to ensure the best methods for their use and development.

5. To prevent sea water pollution due to deliberate dumping of waste.
6. To take the necessary measures which protect the workers exposed to carcinogenic substances and agents.

7. To take preventive measures against occupational hazards originating from the air, noise and vibration pollution in work environment.

8. To take measures for the protection of human and environmental sanitation against detrimental effects which may cause a change in the Ozone layer.


10. Cooperation with neighbouring countries for presentation of assistance in cases of nuclear accidents or radiation emergency.

11. To determine the person responsible for nuclear damages who is the operator of the nuclear establishment.

12. To take measures to ensure non allowance of transportation of hazardous wastes.

13. Conservation of the Mediterranean sea environment to combat pollution from ships, air craft or exploration operations.

14. Non utilization of environmental modification techniques for military purposes to destroy or inflict damage to any state which is a party here of.

15. To prevent ships from unloading their oil cargo or reduce in case of necessity.

16. To take all necessary measures for protecting the Mediterranean Sea area from pollution resulting from discharges from rivers or coastal establishments.

17. Cooperation between Egypt and France in the collection of relevant environmental data.
Egypt obligations according to domestic legislations

1. The 3rd part of law N°4 for 1994 which ensures protection of the marine environment from pollution.


3. Legislation concerning Hazardous substances and residues (1st part of low N°4 for 1994) and an administrative decree issued by the ministry of industry on 1958 concerning the conditions which must be available in the places which handle poisonous and non poisonous substances and their abstracts.


Penal low N° 58 for 1937 article N° 379 penalises any one causing noise at night.


6. The lows and decrees which organize the utilization of lands: Low N° 143 for 1981 and low N°7 for 1991 which organize the utilization of desert lands, the prime minister’s decree N°203 for 1982 relating to the definitions of desert governorates.

The administrative authorities charged with applying the environmental legislations are the Agency for Environmental Affairs Matrouh Governorate.

- Environmental affairs Agency.
- Matrouh Governorate.
- Concerned administrative authorities each in its own field of competence.
دراسة قانونية للتشريعات البيئية الدولية والوطنية المتعلقة بموضوع تنمية فوهة مطرож

تهدف هذه الدراسة إلى بيان القواعد التشريعية البيئية التي يسري الالتزام بها وإداراتها في تنفيذ مشروع تنمية فوهة مطروج وبعض هذه القواعد تمثيلها باتفاقيات الدولية العديدة التي اتسمت بها مصر بشأن حماية البيئة والتي تكتسب قوة القانون الداخلي بعد قرار رئيس الجمهورية بالاستماع إليها وموافقة مجلس الشعب على هذا الانضمام ثم التصديق عليها ونشرها في الجريدة الرسمية وذلك عملاً بمقتضى المادة 151 من دستور مصر الدائم.

وأما البعض الآخر فتوجه التشريعات المصرية الخاصة بالبيئة أو التشريعات ذات الأبعاد البيئية.

وقد تطلبت الدراسة عرض الاتفاقيات الدولية الخاصة بالبيئة والاتفاقيات في مصر بعد الانضمام إليها والتصديق عليها ونشرها في الجريدة الرسمية وبلغ عدد هذه الاتفاقيات في مجموعها عن تسع اتفاقيات منها ثلاث عشرة اتفاقية تتعلق بحماية البيئة بوجه عام وأما السبع الاتفاقيات الأخرى فتعلن بحماية بيئة البحر الأبيض بوجه خاص.

الاتفاقيات التي تتعلق بحماية البيئة بوجه عام

1- المعاهدة الدولية الخاصة بوقاية النباتات الموقعة بروما سنة 1912.

2- المعاهدة الخاصة بحماية الطيور والحيوان والنباتات بحالة بحالة في الطيور والنباتات الموقعة بروما سنة 1933.

3- الاتفاقية الدولية لوقاية الربطة الموقعة في 6 ديسمبر سنة 1951.

4- المعاهدة الأمريكية لحماية النباتات الموقعة يقضي بأنها مؤتمراً للقمة الأمريكية في اجتماعه بالجزائر بتاريخ 9/9/1968.

5- الاتفاقية الدولية لمنع التلوث البحري عن طريق النفايات والمواد الأخرى الموقعة بتاريخ...
6- الاتفاقية الخاصة بالرقابة والسيطرة على الاحترار المائي الناحية عن المواد والعواصم المسمية للسفن والماركز.

7- الاتفاقية حماية العمال من الخطر المائي الناحية عن تلوث الهواء والمصادر والانتشار في بيئة العمل الموقعة في حيتي في 1977/7/20.

8- الاتفاقية الإقليمية للمحافظة على بيئة البحر الأحمر وبحري عدن والبروتوكول المتعلق بها الموقعة بتاريخ 1982/2/14.

9- الاتفاقية فيينا لحماية طاقة الأيون الموسعة في فيينا في 1985/3/22.


13- الاتفاقية بارل بشأن التحكم في نقل الديون الخضراء والتحلول منذ عبر الحدود والموقعة بتاريخ 1984/3/22.

الاتفاقيات التي تتعلق بحماية بيئة البحر الأبيض بالذات:


2- اتفاقية روما عام لمصائد الأسماك في البحر الأبيض المتوسط وقعت مصر في 20 فبراير سنة 1952.

3- اتفاقية حماية البحر الأبيض المتوسط من التلوث والبروتوكول المتعلق بها التي نسحت مصر من هذه الاتفاقية باللأطلال في البحر الأبيض المتوسط في برلين في الفترة من 1972/6/12-1978/6/22.
الاتفاقية الدولية لحظر استخدام تقنيات التغيير في البيئة للأغراض العسكرية أو أية أغراض عدائية. أُحرِّر المرخص في نيويورك بتاريخ 30/12/1967.


6- بروتوكول حماية البحر الأبيض المتوسط من التلوث من مصادر بحرية المواقع في أثينا بتاريخ 17 مايو سنة 1980.

التجديدات المتبقية من الاتفاقات الدولية التي تفرضها الاتفاقات الدولية سالفة البيان عند تنفيذ مشروع تنمية فوهة مطروح:

الالتزامات النابعة من الاتفاقات الدولية والتي ينبغي مراعاتها في تنفيذ مشروع تنمية فوهة مطروح:

1- الاشراط والتفتيش والرقابة على كل أنواع اليدوات إلى الوقاية من انتشار الأمراض والآفات.

2- إنشاء مناطق حزام طبيعية كاملا ومتزهات قومية تشرف عليها هيئة عامة يبيع ويحرم فيها خروبا بانا أي نوع من أنواع صيد الحيوان أو السمك أو عمل من الأعمال الخاصة بالاستغلال العملية أو الزراعة أو التعدين أو الحفر أو الحفريات أو التنقيب أو النهوض أو أي عمل من شأنه تغيير مسار النهر أو النبات أو أي شيء.

3- اتخاذ الإجراءات التشريعية واللغوية الادارية اللازمة لضمان العمل المشترك لمحولية دون اعتلال وانتشار الآفات والأمراض التي تسبب اليدوات والمناجرات البيانية لهومنوس متبادلة.

4- اتخاذ جميع الاجراءات الضرورية للمحافظة على العشائر النباتية والحيوانية وصمام أفضل الطرق لاستخدامها وتمثيلها وأن نراعي عند وضع خطوط التنمية الموالية الحاصلة بجودة سطوح البيئة والعوامل الاقتصادية والاجتماعية.
5 - مع تلوث البحر الباحم عن قلب (الطريق المعصم) العوائق والمواد الأخرى التي يمكن أن تعرقل الصحة البحرية للمحافظة على النزلة والموارد البحرية، فإن ترتيب الاستخدام أو تعرقل الاستعمالات أو مضادات صحية أخرى مكانة في البحر، ويشمل تلوث البحر، كل المياه البحرية من غير المياه الداخلية للمملكة.

6 - انتهاج التدابير اللازمة التي تحمي العمال الذين يتعرضون للمواد أو العناصر المسببة للسرطان أو تعرضوا لها فعلاً أو يمكن أن يتعرضوا لها.

7 - انتهاج تدابير الوقاية من الخطر المجهول الناجم عن تلوث النسيج والصدمات، والاختلاط في بيئة العمل والبحث عنها.

8 - انتهاج كافة التدابير المناسبة من أجل حماية الصحة البحرية والبيئية من الأنماط المضار التي تضر أو يرجح أن تضر بانشطة البحرية التي تحدث أو من المرجح أن تحدث تعديلًا في طبيعة الأوزون.

9 - الاتصال المثمر عن أي حادث نوروي.

10 - التعاون الدولي لتنسيق تدابير الوقاية من تلوث البحر الباحم في حالة وقوع حادث نوروي أو طارئ يتم إبلاغه بالالتزام.

11 - تحديد المسؤول عن الصور النوروي وهو فرع المنشأة المادية المطلوبة في أراضي طف في البروتوكول.

12 - انتهاج التدابير اللازمة لضمان عدم السماح بتدفق النفايات الحمراء أو العوائق الأخرى إلى مواجهة مكتوبة من الجهة المخصصة في الدولة المستورة.

13 - المحافظة على بيئة البحر الأبيض المتوسط والمكافحة للتلوث الباحم عن السفن وعن القاء الفضلات من السفن والطائرات أو عن التلوث الباحم عن عمليات استكشاف الإفريقي القاري، وقاحة البحر، ونقليات تربية الحيوان واستعالةها أو عن التلوث من كل المصادر البحرية الأخرى، تعاون في معالجة حالات التلوث الطارئة وصاحب قرار الإجراءات المناسبة المتعلقة بتحديد المسؤولية القانونية والتعويض عن الأضرار اللاحقة عن تلوث البيئة البحرية، لمحالفة لنصوص الاتفاقية حماية البحر الأبيض.

14 - عدم استخدام تقنيات التغيير في البيئة ذات الآثار الواسعة الاضرار أو الطويلة البقاء أو المنسلحة لأغراض عسكرية أو لأية أغراض عدائية أخرى، كالسيلة لإنقاذ الدمار أو الخسائر أو الاضرار بآية دولة.
أخرى طرف في الاتفاقية.

15- منع السفن على وجه الخصوص ناقلات النفط من تفريغ حمولاتها من الزيوت أو البقول من الالقاء في حالة الضرورة كسلامة السفينة أو طاقمها أو الحمولات التي تقلبها.

16- اتخاذ كفاءة التدابير اللازمة لوقاية منطقة البحر المتوسط من التلوث الدائم عن التصريف من الزيوت أو المنشآت الساحلية أو محارج المخازن أو النافورة في أي مسار آخر وحائزة في أرضها سواء كان ذلك بصورة مباشرة عن طريق التصريف في البحر بالانطفاء في الساحل أو عن طريق نقل أو حمل أو مساحة عبر مبادرة عن طريق الابطاع والقنوات أو المحاجر المائية الأخرى بما في ذلك المحاجر المائية الباسية أو الاسلوب، وبعد تحلل التلوث من مصادر بحرية تقع في أرض الدولة أو مصادر بحرية متصلة عن طريق البحر والتصريفات الملوثة البشعة عن المنشآت الصناعية والتخزين من هذا التلوث ومكافحة والسيطرة عليه.

الالتزامات التي تفرضها التشريعات المصرية والتي ينبغي مراقبتها في تنفيذ مشروع تنمية فوهة مطروح:

أولا: فيما يتعلق بالتشريعات التي تتكفل حماية البيئة من التلوث:

نظم الباب الثالث من القانون رقم 4 لسنة 1994 في شأن البيئة، حماية البيئة المائية من التلوث وحصر الفصل الأول منه للعليا من السفن. والوصول هذا الفصل إلى نظام فروع نافل الفرع الأول منها التلوث من الزيوت، وفي نطاق هذا المراعي حظر القانون على جميع السفن أي كانت جنسيتها تصريف أو النافورة الزوتي أو المراعي النافع في البحر الاقليمي أو المنطقة الاقتصادية الحالية. كما يحظر على الشركات والهيئات الراتبية والاجنبية المصنوع لها باستثمار أو استغلال أو احتكار النافورة البحرية والبترولية الطبيعية الأخرى، بما في ذلك وسائل نقل الزيوت تصريف أي مادة ملوثة بذبابة عن عمليات الحفر أو الاستكشاف أو اختيار الأماكن في البحر الاقليمي أو المنطقة الاقتصادية الحالية لجمهورية مصر العربية، ويجوز عليها استخدام الطرق الأمثل التي لا تزيد عليها الضرر بالبيئة وعملية ميناء تصريف من نفايات ومواد مائية طبقاً لأحدث نظرة البيئة المتاحة، ومما يفيق والشروط المنصوص عليها في الاتفاقية الدولية كما أوجب القانون أن تشير جميع مواطئ السفن والموانئ المعدة لاستقبال مياه الابطاع غير النظيفة ومتطلبات المخلوق الحالة بنافرات الزيوت أو غيرها من السفن.

وأجب كذلك أن تشير موايبيν الأمنية والأوامر اللازمة والكافية لاستقبال المخلوقات والتنقيط والرواسب.
الرئيسي والمزيج الرئيسي من السفن الضارة بالمياه.

وحظر التدريب لأي سفينة بالقيام بأعمال النحل والترميم إلا بعد الرجوع إلى الهيئة الإدارية المختصة
لاستعمالها وتوجيهها إلى أماكن التخلص من النفايات ومواد الإزالة عبر الشبكة.

وأوجب القانون على مالك سفينة أو ربان سفينة مسحلة بجمهورية مصر العربية وكذلك بين الدول التي
تمت إلى الاتفاقية أن يحتفظ سجل للمير بالسفينة ويكون في الموئل عنها جميع العمليات المتعلقة
بالمير.

أما الفرع الثاني من الفصل الأول فقد حرص للتحكم في المواد الضارة فحظر على باقات نوار الصارعة القار
أو تصريف أية مواد ضارة أو محاويث أو محاليل تنتج عنها صور بالبيئة المائية أو صحة العامة أو
الاستهلاكات الأخرى المروعة للمطر.

وحظر على السفن التي تحمل مواد صارعة مقيدة في عيون أو عنايات نحل أو صيحة التخلص منها
بالنقالات في البحر الاقليمي أو المنطقة الاقتصادية الخالصة للجمهورية.

وحظر كذلك القاء الحيوانات النافقة فيها.

وأوجب تجهيز جميع مواد النحل والترميم المعدة لاستعمال هذه الباقات وكذا أحواض إصلاح السفن
بالتسهيلات المناسبة لاستقبال المواد السائدة الضارة ونفايتها.

وخصص الفرع الثالث من الفصل الأول من الداب الثالث للقانون رقم 4 لسنة 1994 للتحكم بمحاليل
الصرف الصحي بدمامات فحظر على السفن والأنشطة البحرية تصريف مياه الصرف الصحي الملزمة داخل
البحار الاقليمية أو المنطقة الاقتصادية الخالصة لجمهورية مصر العربية وأوجب عليها التخلص منها طبقا
لمعايير والإجراءات التي تحددها اللائحة التنفيذية للقانون.

كذلك حظر على جميع السفن المرصية البحرية التي تقوم بأعمال استكشاف واستغلال المواد الطبيعية
المعدنية في البيئة المائية لجمهورية مصر العربية وكذلك السفن التي تستخدم المواد المصدرة لإفرا أو
الفضلات في بحار الاقليمية أو المنطقة الاقتصادية الخالصة للجمهورية.

وأوجب على السفن تسليم القفامة في تسهيلات استقبال الباقات أو في الأماكن التي تحددها الجهات
الإدارة المختصة.
وأوجب تقييم جميع موانئ الشحن والتفريغ والموانئ المعدة لاستقبال السفن وأحواض السفن الشابة أو العائلة بالتجهيزات اللازمة والكافية لاستقبال مياه الصرف الملوثة وفصلات السفن من القدام.

وفي الفصل الثاني من البند الثالث من القانون رقم 4 لسنة 1994 حظر القانون على جميع المنشآت بما فيها انحل الاهتمام والمنشآت البحرية والصناعية والسياحية والحداثة تصرف فيها أو الأعياد أو مواد أو منابع أو موانع غير ملائمة من شأنها إحداث تلوث في الشواطئ المصرية أو المياه المتاخمة لها سواء نموذج ذلك بطريقة ارادة أو غير ارادة مباشرة أو غير مباشرة.

كما اشترط للترخيص بإقامة أي منشآت أو محال على شاطئ البحر أو قريباً منه يتم فيها تصرف مواد مرسية أن يقوم طالب الترخيص بإجراء دراسات تتأثر البيئة. ويلزم توفر وحدات لمعالجة النفايات وأن يبدأ تشغيلها فور بدأ تشغيل تلك المنشآت.

وأذن القانون بالالتحاق التعليمية لمكاشفة المواصفات والمعايير التي تتغير بها المناشط الصناعية التي تصرف منها بتصرف المواد الملونة القابلة للتحلل.

كذلك فقد حظر القانون إقامة أي منشآت على الشواطئ البحرية لمكاشفة لساحة ملائمة متر إلى الداخل من حيط السماوي إلا بعد موافقة الجهات الادارية المختصة بالتنسيق مع جهاز شون البيئة.

وحظر القانون إجراء أي عمل يكون من شأنه المساس بحظر السماوي أو تعديله دخولاً في مياه البحر أو بحضاً عليه إلا بعد موافقة الجهات الادارية المختصة بالتنسيق مع جهاز شون البيئة.

كذلك بمضمون القانون رقم 92 لسنة 1982 في شأن صرف المخلل السائلة صرف تلك المخللات للمجاري العامة في حظر أن تصرف للمجاري العامة المخللات السائلة من انحل الاهتمام أو الصناعية أو غيرها التي يصدر بحذتها عقوبة من وزير الأسنان والمواقع دون ترخيص بذلك من الجهات المختصة على أعمال المجاري وأوجب أن تكون تلك المخللات السائلة التي تصرف بها في حدود المعايير والمياضات المحددة.

كما ينظم القانون رقم 48 لسنة 1982 في شأن حماية البحر والشاطئ المائي من التلوث صرف أو القاء المخلل السائلة أو السائلة أو الكلابة أو الجرافة من الصرف والمنشآت البحرية والصناعية والسياحية إلا بعد الحصول على ترخيص من وزارة البحر في الحالات ووافض المعايير التي يصدر بها ترخيص من وزير البحر باء على الاقتراح من وزارة الصحة وقد حددت المادة الأولى من ذلك القانون ما يشمل من المبادرات لضمن أحكامه وهي:...
أ- مساحات المياه العذبة وتحلول:

١- نهر الليل وفرعه والأحوار.

٢- الرياحات والترشح بجميع درجاتها والحناثات.

ب- مساحات المياه غير العذبة وتحلول:

١- الانصار بجميع درجاتها.

٢- الحيارات.

٣- الرك والمسطحات نائية المعلقة والساحات.

٤- خزانات المياه الجوفية.

وبناءاً على القانون المذكور، بوزارة الري تنفيذ أحكامه ومنح صفة الصلحية القضائية لمقدمي الري بالسماحة للواقعة التي تقع بعدها لاحكامه.

وقد عدل المادة ٩٨ من القانون رقم ٤ لسنة ١٩٩٤ العقوبات المقررة ضعف أحكام المواد ٢.٣.٤.٥ من القانون رقم ٤٨ لسنة ١٩٨٨ في شأن حماية نهر الليل والمجرى البحري من التلوث وذلك بتضمين العقوبات المقررة لها.

ثانياً: التشريعات المتعلقة بالنظافة العامة:

بحث المادة الرابعة من القانون رقم ٣٨ لسنة ١٦٦٧ في شأن السلطة العامة للأعمال التي يرضح ارتكابها من أجل الحفظ على النظافة العامة كما أوضحها اللائحة التنفيذية للقانون المذكور الصادر بقرار وزير الأسنان والمرافق رقم ١٣٤ لسنة ١٩٧٨ الاحتياطات والالتزامات التي يجب توفرها بالنسبة إلى المخالف العمومية أو الخصوصية للتحليص من القيمة أو الفوائد أو المتطلبات.

تم صدر القانون رقم ٤ لسنة ١٩٩٤ في شأن البيئة ووضع على التبراناوات المكشوفة لاحكامه في ممارساتها لاستنادها: بعدم استخدام أو تسرب ملوثات للهواء بما يتجاوز الحدود القصوى المسموح بها وحظر استعمال آلات أو مركبات أو مركبات ينتج عن عادة يتجاوز الحدود التي تقررها لائحة التدبيرية.

وحظر كذلك القاء أو معالجة أو حرق القمامة وتحلل النفايات الصناعية في الأماكن المخصصة لذلك بعيداً عن
المناطق السكنية والصناعية والزراعية وال➡️جاري المالية.
والزم الوحدات المحلية بالانفاق مع حجز شذون البيئة بتحصيص أماكن النفايات أو معالجة أو حرق القمامة والمخلفات الصناعية.
وبصامت مواد القانون المشار إليه على عقوبة أشد من العقوبات المقرر بالقانون رقم 38 لسنة 1967 فيكون قانون البيئة 4 لسنة 1994 هو القانون واجب التطبيق بمقلهانه الأشد.

ثالثا: التشريعات الخاصة بالمولدات والمفاعلات الحطيرة

حظر القانون رقم 4 لسنة 1994 في الفصل الثاني من البند الأول تداول المواد والمفاعلات الحطيرة بعض ترتخيس من الجهه الإدارية الخصصة - وأناق بالبوزانت كل في طاقم اختصاصه بالتنسيق مع وزير الصحة وجهاز شروت البيئة أصدر حدول المواد والمفاعلات الحطيرة.

وحظر القانون إقامة أي منشات بغرض معالجة المفاعلات الحطيرة إلا ترتخيس من الجهه الإدارية الخصصة بعد أحد رأى حماة شروت البيئة وأوجب أن يكون التحلق من المفاعلات الحطرة طبقاً للمشروط والمعايير التي تحدها اللائحة التنفيذية.

وبعهد وزير الأسكان بعد أحد رأى وزاري الصحة والصناعة وجهاز شروت البيئة أماكن وشروط الترتخيس للمفاعلات الحطيرة.

وحظر القانون 4 لسنة 1994 استيراد المفاعلات الحطيرة أو السماح بدخلها أو مزويرها في أراضي جمهورية مصر العربية كما حظر غير تصريح من الجهه الإدارية الخصصة السماح بمرور السمن المنتج حمل النفايات الحطيرة في البحر الإقليمي أو المنطقة البحرية الاقتصادية الخالصة للجمهورية.

وأوجب القانون على القائمين على إنتاج أو تداول المواد الحطيرة أن يتخذوا جميع الاحتياطات بما يضمن عدم حدوث أي أضرار بالبيئة.

وبينظم القرار الوزاري رقم 138 لسنة 1958 من وزارة الصناعة استيراد وتحاول والاختيار من المواد السامة ومستحضراتها التي تستعمل في الصناعة ويوحى القرار المشار به الحصول على ترخيص من مصلحة الرقابة الصناعية عند الاتخاذ في تلك المواد.

كما حدد القرار الإداري لوزارة الصناعة في 28 سبتمبر 1958 على الشروط الواجب توفرها في الخلات والمحازن التي تتح تداول في المواد السامة وغير السامة ومستحضراتها التي تستعمل في الصناعة.
رابعا: التشريعات المتعلقة بالضوضاء


كما يجب استعمال مكرات الصوت في غير العرض الذي صدر المرخص من أجله، أو يجب استعمال مكر الصوت إلا في مكان مغلق لايقبل مساحة عن مائى مترا ولا يتجاوز صوتية الحاصل.

وأوجب القانون على أصحاب المجال المعدة لتركيب مكرات الصوت أن يتنبأوا من الحصول صاحب السند على الترخيص باستعماله أو تركيبه.

كذلك فإن القانون رقم 66 لسنة 1973 في شأن المرور يحظر تركيب سرية هولانية أو ما يعادلها من أجهزة في المركبات ولا حرام صلتها والحكم بمساربتها. كما حظر استعمال أجهزة التنبيه على وجه مختلفة للمقرر في شأن استعمالها ويجبر بمساربة الأجهزة المتصلة في إرتدائها المحلف.

كما حصر ذات القانون تسيير مركبة في الطريق العام تصدر منها أصوات مزعجة أو يميت دخان كفيف أو رائحة كريهة أو ينطوي من حرملكها أو ي👀وض من صلاحيتها للانتهاج أو مصدر ناسلية، أو مؤطرة على صلاحيتها الطريق للنمرور أو يتعارض من حرملكها أنها تشكل خطراً على مستعملي الطريق أو تؤديه.

وبعاقب قانون العقوبات رقم 58 لسنة 1937 في المادة 379 مه من يحصل منه في الليل أو ضاحية مما يذكر راحة السكان.

كذلك أوجب القانون رقم 4 لسنة 1994 في شأن البيئة على جميع الجهات والأفراد عن مباشرة الأنشطة الإنتاجية أو الحدبية أو غيرها وتحذيرها عند تشغيل الآلاف والمعدات واستخدام آلات البيئة ومكرات الصوت أن يلاحظوا بعدم تجاوز الحدود المسموح بها لندراص الصوت. كما أوجب على الجهات ماحة الترخيص مراجعة أن يكون مجموع الأصوات المسموح بها للصوت التابع في منطقة واحدة بمقدار الحدود المسموح بها وتأكدت من التزام المشتبه بإحبار الآلاف والمعدات المناسبة لصحة ذلك.

خامسا: التشريعات المتعلقة بحماية البيئة الطبيعية

صدر القانون رقم 102 لسنة 1983 في شأن الحوافز البيئية دفع الحفاظ العامية الطبيعية بأنها مساحة من الأرض أو المياه الساحلية أو الداخلية تعتبر عن تقدمها من كائنات حية سكان أو حيوانات أو اسماء أو
طوارئ طبيعية ذات قيمة ثقافية أو علمية أو سياحية أو حماسية ويصدر تحددها قرار من رئيس مجلس الوزراء بناء على البراجة حماية شئون البيئة.

ويحظر القانون المذكور القيام بأعمال أو تصرفات أو إنشطة أو إجراءات من شأنها تدمير أو إهدام البيئة الطبيعية أو الأضرار بالحياة البرية أو البحرية أو النباتية أو الحيوانية أو المساواة الحماسية بمنطقة المحايدة.

ولا يجوز بيع تصريح من الجهة المختصة ممارسة أي نشاط أو تصرفات أو أعمال أو خارج من المناطق المختصة بمنطقة المحايدة، والتي يصدر بها قرار من الوزير المختص بناء على البراجة حماية شئون البيئة إذا كان من شأنها التأثير على بيئة المحايدة أو الطوارئ الطبيعية لها.

صدر قرار رئيس مجلس الوزراء رقم 171 لسنة 1986 بإلغاء مح مقاولة العميد بمحافظة مطروح.

كما صدر قرار محافظة مطروح رقم 56 لسنة 1982 يحظر صيد الحيوانات البرية بجميع أوراعها وخاصة الحشرى والأرانب البرية والغزلان في محافظة مطروح في المنطقة المبيضة جنوب الشرق الصحرائي الاستكشادي مطروح وحتى مدينة السلوام وكذلك المنطقة المحيطة بطرق مرسى مطروح. كما يحظر القرار اعطاء تصريح صيد لهذه الحيوانات في المناطق المحيطة بها وتضارك جميع أوراق الصيد المضبوطة مع المحافظين.

وقد نظم القانون رقم 4 لسنة 1994 في شأن البيئة في البلاد الأولى منه حماية البيئة الأرضية من التلوث.

فأوجب على الجهات المانحة أو الجهات المانحة للترخيص، تقييم التأثير البيئي لминاء عين الظروفي، الذي يتم فيه تقديم المقترحات المطلوبة تنفيذها في مجال التجهيزات والأنظمة اللازمة لمعالجة الأذى البيئي السلبي.

وأفاد القانون مسكات الرصد البيئي رصد مكونات وملوثات البيئة دوريا وتأثيث البيانات للحياة العمية.

وأوجب القانون المذكور أن تخصص في كل حي وقرية مساحة لأجل من ألب متر مربع من أراضي الدولة لإقامة منتشر لانتاج الإيجار على أن تنال محتاجات هذه المنتش البيئي لأفراد بسرع الكفالة.

وحظر القانون رقم 4 لسنة 1994 بأية طريقة صيد أو قتل أو املاك الطيور والحيوانات البرية التي تخدم أوراقها للاستفادة التنافسية كما حظر حيازكة هذه الطيور والحيوانات أو نقلها أو التجول بها أو بيعها أو عرضها للبيع حية أو ميتة أو نمل أو أكثارها أو أعدام بيلها.
بتنظيم القرار رقم 264 لسنة 1994 الشروط والقواعد والإجراءات الخاصة بمسارمة الأسماك في مناطق المحايات الطبيعية وأنظمة القرار بحوار مشترك بين الهيئة التطبيقية في مناطق المحايات الطبيعية.

سادسًا: التشريعات التي تنظم استخدامات الأراضي

- ينظم القرار رقم 143 لسنة 1981 استخدامات الأراضي الصحراوية، ويتضمن بها أراضي المملكة للدولة الملكية خاصة والواقعة خارج الزمام بعد مسافة كيلومترات.

وقد أصدر رئيس مجلس الوزراء القرار رقم 203 لسنة 1982 بشأن حدود المحافظات الصحراوية وسروعه اعتبار محافظة مطروح محافظة صحراء.

تم صدر القانون رقم 7 لسنة 1991 في شأن بعض الإحكام المتعلقة بأملاك الدولة الخاصة ونص على أن تكون إما واستعجال والتصرف في الأراضي الصحراوية الخاصة لأحكام القانون 143 لسنة 1981 في شأن الأراضي الصحراوية وفقاً للأجراءات التالية:

(أ) يصدر رئيس الجمهورية قراراً بتحديد المناطق الاستراتيجية ذات الأهمية العسكرية من الأراضي الصحراوية التي لا يجوز تملكها.

(ب) يصدر رئيس الجمهورية قراراً بتحديد المناطق التي تتضمنها حطة مشروعات استصلاح الأراضي أو مناطق إقامة المجتمعات العمرانية الجديدة أو المناطق السياحية.

وقد صدر القرار رقم 7 لسنة 1991 على أن تنظيم الهيئة العامة للتنمية السياحية إدارة واستغلال وتصرف في الأراضي التي تخصص لأغراض إقامة المناطق السياحية وتنظيم الهيئة العامة لمشروعات التعمير والتنمية الزراعية إدارة واستغلال والتصرف في الأراضي التي تخصص لأغراض الاستصلاح والاستزراع.

تتولى هيئة المجتمعات العمرانية الجديدة إدارة واستغلال والتصرف في الأراضي التي تخصص لأغراض إقامة المجتمعات الجديدة.

وتعتبر كل هيئة من الهيئات السابقة سلطات المالك في كل ما يتعلق بالأملاك التي يعود بها إليها، وتنشر مهامها في شأنها بالتنسيق مع وزارة الدفاع ومباشرة ماتقرر من شروط وقواعد تنظيمها شروط الدفاع عن الدولة. كما تحلل وضع الأدلة المحلية كل في نطاق اختصاصها.
ادارة واستغلال والتصرف في الأراضي المعدة للسلاسل المملوكة لها أو للدولة. والإراضي القائمة
للإسترداد داخل الزمام.

وفيما يتعلق بالأراضي المناخمة والممتدة خارج الزمام إلى مساحة كيلومترات فيكون استخلاصها
وفق خطة قومية تمكّنها وزارة استصلاح الأراضي وتولّي تنفيذها بنفسها أو عن طريق الجهات
التي تحددها بالتنسيق مع المحافظة المختصة وتولّي الهيئة العامة لمشاريع التعمير والتنمية الزراعية
ادارة هذه الأراضي واستغلالها والتصرف فيها.

ويحظر على أي شخص طبيعي أو معنوي أن يجوز أو يضيع اليد أو يتعدى على أي حerce من
الأراضي الحاضمة لأحكام القانون 143 لسنة 1981.

ويقع بإلزام ملالي تصرف أو تقرير لأي حق عيني أو حقين أو نسب أو تأثير أو نسكون على تلك
الأراضي بالاختفاء لأحكام القانون المشار اليه ولا يجوز نهبهم ونظام وضع اليد اختالف بالطرق
الادارية.

وقد حدد القاضي المذكور الحد الأقصى للملكية في الأراضي الصحراوية الحاضمة لأحكامه وفقا
لمعاقبة عجيدة أو نكسة أو تزوير الري من تنستند انقراض واقتصاد . يحظر القانون حفظ أي أبار سطحية أو
عميقة بالأراضي الصحراوية إلا بعد موافقة الهيئة العامة لمشروعات التعمير والتنمية الزراعية ضِمَّا
لمشروط والأوضاع التي تحددها وفعلاً خذت من الأرى والشريعة الجحيدة.

2- نصت اللائحة التنفيذية للقانون 143 لسنة 1981 على أن تتمتع مشروعات الاستصلاح والاستزراع
التقريبي على الأراضي الحاضمة لأحكامه بذات القواوعد والأحكام والتقييمات والاعضاءات
والإجراءات المخصوص عليها في القانون رقم 59 لسنة 1979 في شأن المجمعات العمرانية الجديدة
أيا كانت الهيئة أو الشخص الذي يقوم بها وهي اعتناء صبيحة وحممكة .

3- لما كانت الأرضي التي يجري تنفيذ مشروع تنميةgets شبكة حاضمة لأحكام القانون 143
لسنة 1981 وسننة 1991 فإنه يبقى التحقّق من الأرضي التي تقع في نطاق المشروع ليست من
المتاع الاستراتيجية ذات الأهمية العسكرية التي يشتمها قرار رئيس الجمهورية بمحمد تلك المناطق
كما يبقى على القائمين على تنفيذ المشروع التعامل مع الجهة المختصة حسبما حددتها القواعد
السابقة.
4- أناط القانون رقم 22 لسنة 1974 المعدل بالقانون 113 لسنة 1975 بوزارة الأسكان والتعتيم ومعظمة هيئة الانتقادات، مستقلة وذلك في إطار هيئة التنمية الاقتصادية والاجتماعية العامة للدولة، وقرر القانون لشركات المقاولات الأجنبية والبيوت الاستثمارية الأجنبية العامة في شروط بيع العقارات الصربية المفردة للأسكان الأحمر بمقدار واحد أو أكثر، وبان نظام الحظر. كما يتمتع بذات الامتيازات العملية التي تقدم بها شركات المقاولات أو البيوت الاستثمارية المصرية بالتعاون مع شركات أو بيروت أجنبية في المشروعات التي يكون التعاون فيها من مقتضيات التعاون يصدر حديثها نقرار من وزير الأسكان والتعتيم. وتعود الجهات القائمة بالتحقيق من منظمة حركة وخبراء من الخبراء وال السموم المتصدقة على الويادات من المواد والأدوات والأدوات والنقل اللازم لمشروعات التعمير والتي يصدر بذلك قرارًا من وزير الأسنان. وفي صنع هذا القانون ينبغي التحقيق من أن مشروع التنمية في穴ة مشروع يربط حديثة تعمير الصحراء الغربية التي وضعها وزارة الأسنان والتعتيم ولا يتعرض معها.

5- يعتبر القانون رقم 19 لسنة 1979 في شأن المجمعات العمرانية الجديدة المخصصة تلك المجمعات بأنها كل تجمع بشري متواضع يستهدف خلق مراكز عشوائية جديدة فتح الاستقرار الاجتماعي والراحة الاقتصادية (الصناعي والترفيهي والتجاري وغير ذلك من الأعمال) بمشدد إعداد توزيع السكان عن طريق تحديد أراضية متحدة خارج نطاق المدن والقرى القائمة. كما ص على أن تكون هذه المجمعات العمرانية الجديدة - دون غيرها - حلا للدولة المحتمل عن إنشاء هذه المجمعات العمرانية. ويفسر القانون عن إنشاء المجمعات العمرانية الجديدة، في الأراضي الزراعية، ويوجب القانون المشار إليه تخصيص مساحة من الأراضي لزيادة حصة كيلومترات حول المجتمع العمراني الجديد من جميع الجهات تحديدا هذه المجمعات العمرانية الجديدة حماية التصرف فيها بأي وجه من الردود أو استغلالها أو استعمالها أو دخولها في تعديل أو إقامة أي مباني أو مباني أو أية أخرى على أي شكل من الأشكال إلا معوية البيئة. كما تخصيص مساحة من الأرض مقدارها مائة متر على حسبا وطول الخط الأدنى الموصل إلى المجمعات العمرانية الجديدة تحصص للذات القديم الاستثنائي. ومن القانون المذكور أيضاً على إعداد عقود حصرية وضرورية لهذا المجمعات العمرانية الجديدة والأفراد والشركات المشتركة معها كما قرر إشراك مستشاري البنوك التي تقدب المجمعات العمرانية الجديدة من الضريبة على العقارات المبنة من الضرائب والرسوم الإضافية المتعلقة بها لمدة عشر سنوات وكذلك إعفاء الأراضي الواقعة في نطاق المجمعات العمرانية.

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الحديدة والتي يتم استصلاحها وزراعتها من ضرير الأراضي والصراط والرسوم الإضافية المتعلقة بها لمدة عشر سنوات من تاريخ جعل الأرض صالحة للزراعة.

- كذلك صدر القانون رقم 3 لسنة 1982 بشأن التخطيط العمراني فنص على أن تكون الهيئة العامة للتخطيط العمراني هي جهاز الدولة المسؤول عن رسم السياسة العامة للتخطيط العمراني وإعداد خطط وبرامج التنمية العمرانية على مستوى الجمهورية كما تباشر مسئولية التطبيق من تطبيق تلك الخطط طبقاً لأحكام القانون وأبتد هذا القانون بموجات الجليدة كل في دائرة احتضانها اعداد مسروقات التخطيط العام للمدن والقرى يراعي في اعدادها أن تكون عامة وشملت ومحة لاحتياجات العمرانية وأن تكون قائمة على أساس من الدراسات البيئية والاجتماعية والاقتصادية والاجتماعية وأن يراعى فيها وجهة النظر العسكرية وموجات سلامة الدفاع عن الدولة. كما يضم هذا القانون تقسيم الاراضي وحظر أقامة مبان أو تنفيذ أعمال على قطع أراضي التصميم أو أصدار تراخيص ببناء عليها إلا بعد استيفاء الشروط المبينة بالقانون.

سابعا: التشريعات الخاصة بالحوادث البحرية

- صدر القانون رقم 79 لسنة 1961 في شأن الكوارث البحرية والجيولوجيا البحرية وأوجب الإخطار على أية أنماط استناد أو العلم بأشياء كارثة بحرية إلى أقرب ميناء إذا تقرر إلقاء السلعةwięksة. كما أوجب على السلطة المحلية التي تتلقى البلاغ أن تصدر فوراً بإبلاغها إلى إدارته أقرب ميناء.

ب- نص القانون رقم 4 لسنة 1944 في شأن الهيئة على أنه مع عدم الالحال بأحكام القانون رقم 79 لسنة 1961 يكون لمثلية الهيئة الإدارية المنتخرجة أو لمأموري الضبط الخاص أباً أتبرعوا بناء السفينة أو المسول عنها طالب الإجراءات الكافية للحماية من أن تكون في حالة وقوف حادث لأحدى السفن التي تحمل الزيت بقرب عليه أو يخشى منه نقله البحر الاقليمي أو المنطقة الاقتصادية الحالية لجمهورية مصر العربية.

كما أوجب القانون المشار إليه على مالك السفينة أو ربانها أو أي شخص مسئول عن ذلك الممتلكين عن وسائل نقل الزيت الواقعة داخل الموانئ أو البحر الاقليمي أو المنطقة الاقتصادية الحالية لمصر أن يدروا فوراً إلى إبلاغ الجهات الادارية المنتخرجة عن كل حادثة تسببت في حادثة نقل الزيت فور حدوثه مع بيان طريقة الحادث ونوع المادة المضخة والإجراءات التي اتخذت لإنقاذ السفينة أو الحادثه وغيرها.

ذلك من البيانات المنصوص عليها في الاتفاقية واللائحة التنفيذية للفقرات.
وجاز القانون، لسنة 1994 لم señal الجهة الإدارية المختصة أو تأهلي الصيغة القضائي أن يأمر
رائ السفن، وإلزامها باتخاذ الإجراءات اللازمة للمتغلب من قار النفايات وذلك في حالة وقوع
حبار. عدد السفن التي تحتوي مواد ضارة يحشي بها تلوث البحر الإقليمي أو المنطقة
الاقتصادية الحالية لجمهورية مصر العربية.

الأنشطة الإدارية القائمة على تطبيق التشريعات البيئية:

عرضت الدراسة بين الأجهزة الإدارية القائمة على تطبيق التشريعات البيئية وعلى رأسها جهاز
هيئة منصات البيئة، بخصوص إعداده. كما عرضت الأجهزة الخليجية لممثلة في محافظة مطروح وكذا الحبات
الإدارية مختصة كل فيما يخصه قواعد الصيد والنقل البحري والксن والتشكيل والتعقيم والرى
بالإضافة إلى الجهات الأخرى التي حددتها البند 38 من المادة الأولى من القانون رقم 4 لسنة 1994

ويشمل:

أ- جهاز منصات البيئة

ب- مصلحة الموانئ والمناطق النهرية

ج- هيئة قناة السويس

د- هيئة الموانئ بجمهورية مصر العربية

ه- الهيئة المصرية العامة لحماية السواحل

ر- الهيئة المصرية العامة للمشروطات

ز- الإدارة العامة لشرطة المطارات المائية

ح- الهيئة العامة لتنظيم السياحة

ط- الجهات الأخرى التي يصدر بتحديدها قرار من رئيس مجلس الوزراء
ANNEX VIII

PROTECTION AND MANAGEMENT OF SPECIALLY PROTECTED AREAS AND HISTORIC SITES
The Regional Activity Centre for Specially Protected Areas was established by the Contracting Parties to the Barcelona Convention with a view to provide assistance to the Mediterranean countries in the implementation of the SPA Protocol, adopted in 1982 in Geneva.

RAC/SPA provides direct assistance in the field of development of protected areas (identification, elaboration of the proper legislation to protect the identified site). RAC/SPA also provides assistance in the preparation of management plans for the protected areas.

RAC/SPA (Tunis Centre) is also in charge of the coordination and the implementation of three Action Plans:

- The Action Plan for the management of the Mediterranean monk seal which is a very endangered species;
- The Action Plan for the conservation of Mediterranean marine turtles;
- The Action Plan for the conservation of cetaceans in the Mediterranean Sea.

These actions plans are adopted as regional strategy for the conservation of these species.

Within the framework of the implementation of these action plans, the Tunis Centre carries out surveys to identify habitats and nesting sites for marine turtles.

It also organises training sessions and expert meetings to evaluate the status of the species and the implementation of the measures recommended by the Action Plan.

More information on the RAC/SPA activities are included in the document distributed in Arabic and English.
7.3.5 Specially Protected Areas

The main objective of the item 7.3.5 is on one hand to identify the sites of interest and sensitive species in need of protection and on another hand to propose measures for their conservation and/or management. These measures should give solutions to stop and if possible to reverse the degradation of the natural sites and the loss of habitats and rare species. The proposed measures have to be harmonized with the existing and planned economic activities in the project area.

The activities conducted within this framework by the Regional Activity Centre for Specially Protected Areas are:

- Collection and analysis of data and documentation relevant to the marine and terrestrial ecosystems of the Fuka-Matruh area;

- Establishment on the basis of the collected information of an inventory of recorded species in the area which need a particular protection including specific recommendations to preserve or to improve the protection for the endemic and endangered species with special reference to the marine turtles and marine vegetation;

- Selection of environmental sensitive sites on the area, and proposal of some general measures in order to preserve their biological and ecological value,

- Identification of the needed field investigation to improve knowledge on the ecosystems in the Fuka-Matruh area.

Two reports were produced:

Report 1: The marine ecosystems of Fuka-Matruh Area (Egypt). (Status of species and habitats)

This report was prepared by Dr. Ali Ibrahim Beltagy, it includes general information on climate, geomorphology, bathymetry and describes the main components of marine ecosystems in the area. The report highlights the richness of the marine life in the Fuka-Matruh area and stress the need for conservation measures specially in three sites identified by the author: Rass ElHekma, Abu Hashafa bay and the Matrooh lagoon.
Report 2: The terrestrial Ecosystems of Fuka-Matruh area (Egypt)
(Status, Protection and Management Measures)

This report, prepared by Dr. Mohamed Abdelgawad Ayyad, describes the seven main terrestrial habitats that can be recognised in the areas. The report includes also a list of plant species identified as rare or endangered by the consultant who indicated for each listed species, based on available knowledge, the following information: status, distribution habitat and ecology. As uncontrolled grazing is among the main causes of degradation of terrestrial ecosystems in the area, the report recommends to promote Pilot areas for grazing control.

In 1993, a survey of the western Mediterranean coast of Egypt was carried out for the assessment of marine turtle nesting occurrence. The survey was organised by RAC/SPA, Mediterranean Association to Save the Sea Turtles (MEDASSET) and the National Institute of Oceanography and Fisheries (NIOF, Alexandria). The coastline of the CAMP project area was assessed the beaches of Gulf of Hekma and the Abu Hashafa Bay were identified as potential sites for marine turtle nesting.

In order to ensure an appropriate integration of the cultural sites of interest in the conservation and management plan to be prepared for the area, RAC/SPA asked Dr. Feisal Esmaeel to carry out inquiries and field investigation to identify the main archaeological relics and other components of the cultural heritage existing in the project areas. The report produced within this framework provides an inventory of the major sites and proposes measures for their rehabilitation and/or protection taking into account the concepts of integrated development.

The data and information made available by the mentioned work of the consultants activated by RAC/SPA show the richness and also the sensitivity of the sites and species in the Fuka-Matruh area. The next step will be the elaboration on the basis of these data of an global management plan for the project area. Taking into account the environmental characteristics of the area and the social aspects, the management plan will outline the boundaries of the sites in need of protection and will propose guidelines in order to:

- Insure that the economic activities developed are sustainable and not affect the natural resources, landscapes and cultural relics.

- stop the loss of habitats and rare or endemic species by promoting the conservation of biological diversity.

- improve and allow regular updating of the knowledge on the fauna and flora species and habitats.

We hope also to finalize within the next step the preparatory work for the establishment of a protected area in Ras El Hakam.
برنامج إدارة المناطق الساحلية

لمنطقة فوكة - مطروح (جمهورية مصر العربية)

حماية المواقع الطبيعية والمحافظة على الأنواع الحيوانية والنباتية

إن الهدف الرئيسي لهذا الجزء من الدراسة هو تحديد المواقع ذات القيمة الطبيعية والأنواع الحيوانية والنباتية الحساسة التي هي في حاجة إلى إجراءات خاصة لحمايتها والحفاظ عليها. كما تهدف الدراسة إلى تدريج بعض المفاهيم والطريقة العملية التي تمكن من التصدي إلى تدهور بعض المكونات المحيط الطبيعي في المنطقة.

في هذا الإطار عمل مركز تونس للأنشطة الإقليمية للمناطق المنتدمة بحماية خاصة على القيام بما يلي:

- جمع وتحليل المعطيات والدراسات المتوفرة والمتعلقة بالمصادر البيئية بالمنطقة بما في ذلك المنظمات البيئية البحرية.

- وضع قائمة للأنواع النباتية والحيوانية المهددة مع تقديم اقتراحات وتصور إجراءات عملية لحمايتها.

- انتقاء أهم المواقع الطبيعية الحساسة التي يجب حمايتها حتى تحافظ على قيمتها البيئية.

وقد ساهم الدكتور محمد عبد الجواد، والدكتور علي إبراهيم البنجفي في إعداد ما ذكر من دراسات وذلك بصفة ترتيبين هما:

- المنظمات البيئية البحرية بمنطقة فوكة - مطروح

- المنظمات البيئية البرية بمنطقة فوكة - مطروح

كما أجريت خلال صيف 1993 وفي نطاق مسح للمواقع المنطقة الغربية المصرية خصوصا لبعض مواقع الأسلاف البحرية ومواقع تمشيهم، دراسة مناطق عدة من الساحل الممددة في منطقة المشروع. وبيعت هذه الدراسة لأهمية شواطئ عديدة بالمنطقة كمواقع تمشي الأسلاف البحرية.

وحتى تكون الخطة المزمع وضعها لتحقيق التوازن بين برامج التنمية الاقتصادية والمنطقة ومتطلبات المحافظة على البيئة الطبيعية شاملة، ونظرا لما يوجد من علاقة وطيدة بين التراث الطبيعي والتراث التاريخي، طلب من الدكتور

فيصل إسماعيل بالقيام بدراسة لأهم المواقع التاريخية بالمنطقة وقام بالدكتور تقرير في هذا الموضوع.

تفقد الدراسات والتقارير المذكورة والتي أدعت في نطاق هذا المشروع إلى تواجد بعض المواقع التي ستحسن وضع خطة لحمايتها والحفاظ عليها ومن أهم هذه المواقع منطقة مراس الحكمة، كما تشير التقارير إلى تواجد بعض الأنواع النباتية السايرة في طريق الانتشار في المنطقة، ومن الممكن أن تتفاوضوا بعضًا واتجاه برنامج يمكن من الانتظار على بدورها ويأمل أن تكون في مجال معا، كما تلتقي هذه الدراسات إلى أن الخط المائي من بعض النشاطات البحرية هو السبب الرئيسي لحالات تدمير البيئة الطبيعية المسجلة. مع العلم أن حالة البيئة الطبيعية العامة بالمنطقة تعتبر جيدة. ستخصص المرحلة الأخيرة من هذه الدراسة إلى إعداد خطة مرتبطة بحماية وادارة التراث الطبيعي بالمنطقة وذلك بالاعتماد على المعطيات التي وفرتها الدراسات السابقة الذكر.
ANNEX IX

SOIL EROSION AND DESERTIFICATION
Progress Report

Activity title: Soil Degradation and Desertification.
Subcontract: 55/PAP/94
National team: Prof. Dr. Fawzy H. Abdel-Kader  Dr. Mohamed H. Bahnassy
Dr. Ashraf M. Moustafa  Dr. Abdel-Aziz B. El-Menshawy
PAP consultant: Prof. Dr. G. Ferrari and his colleagues, University of Firenze, Italy.

Analysis of the existing situation:

1. General workplan: The workplan envisages three groups of activity:
   a. Soil survey;  
   b. soil degradation assessment; and  
   c. rainfall simulator and wind transport of sand measurements.

2. Geographic coverage: Two pilot zones in the area of Fuka were identified:
   - Wadi Qasaba, 20 km east of Marsa Matrouh, which is typical for wadi bottom agricultural use, and for soil conservation and water harvesting practices by stone dams across the stream.  
   - Fuka Basin, 80 km east of Marsa Matrouh, which stretches over an area of 17,000 ha and contains three distinctive geographical units: the lower coastal plain, the upper coastal plain, and the table land.

In pursuing the above activities, modern techniques have been applied using the material available at Soil Science Department, Alexandria University, such as: topographic maps, aerial photographs, existing soil and land use studies, geologic and geomorphologic maps and reports.

3. Reviewing of Previous Studies: Intensive reviewing of previous studies on Fuka and Qasaba, NWC has been carried out that involved: FAO 1970, Vol. 5: special studies, b. Land Master Plan 1986, and c. Technical published papers on NWC.

4. Equipments: The PAP purchased the following equipments, and were already received in Alexandria: 1 sieving kit, 1 top loading balance, 3 soil augers.

5. Training on Aerial photo interpretation:
   Date and location: 11-25 March 1995, Matrouh.
Local personal: A. Moustafa, A. El-Menshawi, A. El-Monaem, W. Mahmoud

6. Field and Lab Accomplishments: Field and laboratory for Wadi El-Qassaba pilot area work were completed. Field work for Fuka pilot area is now going on.
7. **GIS Spatial Analysis**: Topographic and geomorphological maps of Fuka, and Qassaba were digitized and analyzed using TERRASOFT GIS software. It included the features: contours, roads, wadi coarse, agricultural lands, well locations, houses, and elevation heights, and geomorphological units.

**Results:**

1. **Geomorphological units**
   
   **1.1. Fuka Sample area**: Based on API of 1:50000, 1954 maps the following geomorphological units and subunits were identified: (Map 1):

<table>
<thead>
<tr>
<th>Unit</th>
<th>Subunit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Coastal Dunes</td>
<td>1.1. Beachs</td>
</tr>
<tr>
<td></td>
<td>1.2. Dunes</td>
</tr>
<tr>
<td></td>
<td>1.3. Salt marshes (Lagoon)</td>
</tr>
<tr>
<td>2- Ridges</td>
<td>2.1. Coastal ridge</td>
</tr>
<tr>
<td></td>
<td>2.2. Discontinuous ridges</td>
</tr>
<tr>
<td></td>
<td>2.3. Continuous ridges</td>
</tr>
<tr>
<td></td>
<td>2.4. Intra ridge land</td>
</tr>
<tr>
<td>3- Inter ridges</td>
<td>3.1. Alluvial plain</td>
</tr>
<tr>
<td></td>
<td>3.2. Harvesed sand plain</td>
</tr>
<tr>
<td>4- Foot slop</td>
<td>4.1. Steep</td>
</tr>
<tr>
<td></td>
<td>4.2. Very steep</td>
</tr>
<tr>
<td>5- Low dissected plateau</td>
<td>5.1. Rocky hillock</td>
</tr>
<tr>
<td></td>
<td>5.2. Intra rocky hillock</td>
</tr>
<tr>
<td>6- High dissected plateau</td>
<td>6.1. Rocky hill</td>
</tr>
<tr>
<td></td>
<td>6.2. Intra rocky hill</td>
</tr>
<tr>
<td>7- Escarpment</td>
<td></td>
</tr>
<tr>
<td>8- Plateau</td>
<td>8.1. Rocky plateau</td>
</tr>
<tr>
<td></td>
<td>8.2. Stony plateau</td>
</tr>
<tr>
<td></td>
<td>8.3. Hummocky land</td>
</tr>
<tr>
<td></td>
<td>8.4. Shallow depressions (Spotted)</td>
</tr>
<tr>
<td>9- Wadi System</td>
<td>9.1. Wadi bottom</td>
</tr>
<tr>
<td></td>
<td>9.2. Alluvial fan (old, recent)</td>
</tr>
</tbody>
</table>

-2-
1.2. Qassaba sample area: Based on the API of 1:25000, 1970 map the following geomorphological units and subunits were identified (Map 2):

<table>
<thead>
<tr>
<th>Unit</th>
<th>Number</th>
<th>Subunits</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Coastal Dunes</td>
<td>1</td>
<td>Coastal Dunes</td>
</tr>
<tr>
<td>2- Coastal Lagoon</td>
<td>2</td>
<td>Salt march with high water table</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Higher land without water table above 1m</td>
</tr>
<tr>
<td>3- Ridges</td>
<td>4</td>
<td>Ridges</td>
</tr>
<tr>
<td>4- Inter Ridges</td>
<td>5</td>
<td>Hummocky deep land</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>Harvesed sand plain</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>Eroded hill</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Depressions</td>
</tr>
<tr>
<td>5- Dissected plateau</td>
<td>9</td>
<td>Rolling land</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>Rocky hill</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>Foot slope</td>
</tr>
<tr>
<td></td>
<td>12</td>
<td>inter hill land</td>
</tr>
<tr>
<td></td>
<td>13</td>
<td>Complex</td>
</tr>
<tr>
<td>6- Plateau</td>
<td>14</td>
<td>Rocky plateau</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>Hummocky shallow land</td>
</tr>
<tr>
<td></td>
<td>16</td>
<td>Accum. in drains</td>
</tr>
<tr>
<td>7- Wadi system</td>
<td>17</td>
<td>Wadi course</td>
</tr>
<tr>
<td></td>
<td>18</td>
<td>Wadi Terraced</td>
</tr>
<tr>
<td></td>
<td>19</td>
<td>Alluvial fan</td>
</tr>
</tbody>
</table>

2- Soil units of Wadi Qassaba

Through April-August 1995, field and lab. work were carried out to characterize the main soil units of wadi el-Qassaba. 29 profiles and 11 augerholes were described. The soil description was compiled, and each soil horizon was sampled for laboratory analysis. In the lab, pH and electrical conductivity of saturation extracts were measured in each soil sample. The soil texture, total calcium carbonate, soluble calcium, magnesium, sodium, potassium, chloride, sulphate, carbonate and bicarbonate ions were determined. Organic carbon content and grain size distribution were determined in surface sample. According to the morphological features, and the physical and chemical properties (table 2), the Soils of Wadi El-Qassaba were classified into Entisols and Aridisols orders.
2.1. *Entisols:* Two great group were identified:

2.1.1. *Xeropsammets:*

*Xeropsammets* domianted the following geomorphological units: Coastal lagoon, Inter Ridges, and Wadi system (table 1). The soils have A/C profile (profiles 2, 3, 11, 13, 19, 25, 27 and 28). They are characterized by sandy texture to a depth of 1m, the absence of the diagnostic horizons and are not saturated with water. Main chemical and physical properties were reported. The pH values ranged from 7.4 to 8 and EC ranged from 27 to 64 ds/m. The total CaCO₃ varied from 49 to 23 % (table 2).

2.1.2. *Xerorthents:*

*Xerorthents* dominated the following geomorphological units (table 1): Dissected plateau, Complex, Wadi system, and Inter Ridges. The Soils represented by profiles (1, 7, 18, 21, 22, 23 and 26) have an ochric epipedon, loamy sand or sandy loam or sandy clay loam texture below a depth 25 cm and are not permanently saturated with water. The pH values ranged from 8 to 8.3, electrical conductivity (EC) ranged between 0.34 to 19.5 ds/m. The total CaCO₃ ranged from 8.9 to 29.8 %. The sand content ranged between 41% to 84%, clay content varied between 6 to 41% (table 2).

2.2. *Aridisols:* Two great group were identified.

2.2.1. *Aquisalids:*

*Aquisalids* dominated the following geomorphological units (table 1): Coastal lagoon and Dissected plateau. The soils represented by profiles (8, 9, 17, and 29) have an ochric epipedon, loamy sand or sandy loam below 25 cm of the soil surface. The pH values varied from 7.1 to 7.9. The EC ranged between 1.46 to 120 ds/m. The total CaCO₃ varied from 8.2 to 19.8 %. The sand content varied between 44% to 86% and the clay content ranged from 9% to 34%.

2.2.2- *Petrocalcids:*

*Petrocalcids* dominated the following geomorphological units (table 1): Inter Ridges, Dissected plateau, Plateau, and Wadi system. The soils represented by profiles (4, 5, 6, 10, 12, 14, 15, 16, 20 and 24) were classified into *Petrocalcids*. They have petrocalcic horizon that has its upper boundary within 100 cm of the soil surface. They are characterized by pH values ranged from 7.3 to 8 and electrical conductivity from 0.36 to 41 ds/m. The total calcium carbonate ranged from 9.1% to 28%. The sand and clay contents varied from 44% to 86% and from 7% to 43% respectively (table 2).

3- GIS Spatial Analysis:

Topographic feature, contour, was used to generate Digital Elevation Model (DEM) for Wadi El-Qassaba and Fuka pilot areas. The DEM was used to generate Slope and Aspect maps. The areas of the geomorphological units were obtained after processing the vector theme of the geomorphology units. Cross operation was applied to the geomorphology map with DEM, Slope, and Aspect to determine the the topographic characteristics of each mapping unit, (tables 3 and 4). The geomorphology map of Wadi EL-Qassaba was reclassified to get the soil classification.
October - December 1995 Activities:

1- Soil erodibility maps.

2- Rainfall and wind erosivity data analysis.

3- Erosion hazard
   Empirical model (USLE)
   Predictive model (WEPP)

4- Setting up and monitoring of erosion field plots!

5- Setting up and monitoring of wind field sampler!
Geomorphological Units
Fuka, sample Area AIP (1:50000) 1954.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Subunit</th>
<th>Unit</th>
<th>Subunit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1- Coastal Dunes</td>
<td>1.1. Beaches</td>
<td>5- Low dissected plateau</td>
<td>5.1. Rocky hillock</td>
</tr>
<tr>
<td></td>
<td>1.2. Dunes</td>
<td>5.2. Inter rocky hillock</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1.3. Salt marshes (Lagoon)</td>
<td>6- High dissected</td>
<td>6.1. Rocky hill</td>
</tr>
<tr>
<td>2- Ridges</td>
<td>2.1. Coastal ridge</td>
<td>6.2. Inter rocky hill</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2.2. Discontinuous ridges</td>
<td>7- Escarpment</td>
<td></td>
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<tr>
<td></td>
<td>2.3. Continuous ridges</td>
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</tr>
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<td></td>
<td>2.4. Intra ridges land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3- Inter ridges</td>
<td>3.1. Alluvial plain</td>
<td>8- Plateau</td>
<td>8.1. Rocky plateau</td>
</tr>
<tr>
<td></td>
<td>3.2. Harassed sand plain</td>
<td>8.2. Stony plateau</td>
<td></td>
</tr>
<tr>
<td>4- Foot slope</td>
<td>4.1. Steep</td>
<td>8.3. Hummocky land</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4.2. Very steep</td>
<td>8.4. Shallow depressions</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>9- Wadi System</td>
<td>9.1. Wadi bottom</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>9.2. Alluvial fan</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(old, recent)</td>
</tr>
<tr>
<td>Units</td>
<td>Sub Units</td>
<td>Taxonomic Name</td>
<td>Profile NO.</td>
</tr>
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<td>----------------------------</td>
<td>--------------------</td>
<td>-------------</td>
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<td>1-Coastal dunes</td>
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<td>-</td>
<td>-</td>
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<td>2-Coastal Lagoon</td>
<td>2-Salt March</td>
<td>Aquisalids</td>
<td>29</td>
</tr>
<tr>
<td></td>
<td>3-Higher Land</td>
<td>Xeropsamments</td>
<td>28</td>
</tr>
<tr>
<td>3-Ridges</td>
<td>4-Ridges</td>
<td>-</td>
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</tr>
<tr>
<td>4-Inter Ridges</td>
<td>5-Hummocky deep land</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>6-Harvesed Sand Plain</td>
<td>Petrocalcids</td>
<td>4</td>
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<td></td>
<td>7-Eroded hill</td>
<td>-</td>
<td>-</td>
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<td></td>
<td>8-Depressions</td>
<td>Xerorthents</td>
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<td>Petrocalcids</td>
<td>6, 24</td>
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<td>Xeropsamments</td>
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<td>10-Rocky hill</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>11-Foot Slope</td>
<td>Xeropsamments</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>12- Inter hill land</td>
<td>Aquisalids</td>
<td>8, 17</td>
</tr>
<tr>
<td></td>
<td>13- Complex</td>
<td>Petrocalcids</td>
<td>16</td>
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<td>6- Plateau</td>
<td>14- Rocky plateau</td>
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<td>-</td>
</tr>
<tr>
<td></td>
<td>15- Hummocky shallow land</td>
<td>Petrocalcids</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>16- Accum. in drains</td>
<td>Petrocalcids</td>
<td>10, 12, 20</td>
</tr>
<tr>
<td>7- Wadi system</td>
<td>17- Wadi course</td>
<td>Xeropsamments</td>
<td>11, 2, 3, 13, 19</td>
</tr>
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<td>18- Wadi terraced</td>
<td>-</td>
<td>-</td>
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<td></td>
<td>19- Old alluvial fan</td>
<td>Xerorthents</td>
<td>7, 21, 22</td>
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<td>27</td>
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<td></td>
<td></td>
<td>Petrocalcids</td>
<td>5</td>
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<tr>
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<td></td>
<td>Xerorthents</td>
<td>23</td>
</tr>
</tbody>
</table>
Table 2: Main Chemical and Physical Characteristics of Wadi El-Qassaba.

<table>
<thead>
<tr>
<th>prof. NO.</th>
<th>Depth (cm)</th>
<th>pH</th>
<th>EC (dS/m)</th>
<th>CaCO3 (%)</th>
<th>Sand%</th>
<th>Silt%</th>
<th>Clay%</th>
<th>Texture</th>
<th>Textural Class</th>
<th>O.M. (%)</th>
<th>Sand &gt; 1mm (%)</th>
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<tbody>
<tr>
<td>1</td>
<td>0-20</td>
<td>7.70</td>
<td>0.75</td>
<td>15.90</td>
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<td>11.00</td>
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<td>S.L</td>
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<td>8.00</td>
<td>0.34</td>
<td>14.90</td>
<td>73.00</td>
<td>10.00</td>
<td>17.00</td>
<td>L.S</td>
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<tr>
<td></td>
<td>50-70</td>
<td>8.30</td>
<td>0.54</td>
<td>19.20</td>
<td>83.00</td>
<td>5.00</td>
<td>12.00</td>
<td>L.S</td>
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<td>70-100</td>
<td>7.80</td>
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<td>21.30</td>
<td>71.00</td>
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<td>13.40</td>
<td>86.00</td>
<td>3.00</td>
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<td>L.S</td>
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<td>60-110</td>
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<td>0.36</td>
<td>18.60</td>
<td>84.00</td>
<td>2.00</td>
<td>14.00</td>
<td>S.L</td>
<td></td>
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<td>0-20</td>
<td>7.60</td>
<td>0.68</td>
<td>12.80</td>
<td>91.00</td>
<td>3.00</td>
<td>6.00</td>
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<td>0.12</td>
<td>1.20</td>
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<tr>
<td></td>
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<td>7.70</td>
<td>0.32</td>
<td>9.40</td>
<td>89.00</td>
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<td>60-100</td>
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Table (4): Main topographic characteristics of Fuka Basin.
ANNEX X

WATER RESOURCES MANAGEMENT STUDY
ANNEX X

In 1993 one mission on water resources management has been carried out by a reputed Egyptian expert. His task was to make an initial assessment of the problems in the area. However, little has been done since then. However, the issue of water resources has been tackled by most of other activities within CAMP, particularly one on soil erosion and degradation. With regard to future activities and the deadlines established in the finalization of CAMP, two possibilities will be explored: to undertake the activities providing the adequate "niche" be found (in order not to overlap with activities of other organisations active in the region) or to cover the issue of water resources by using results of other activities, therefore without undertaking any special action on the side of PAP/RAC.
ANNEX XI

REMOTE SENSING FOR THE ASSESSMENT OF NATURAL RESOURCES IN THE AREA
COASTAL AREA MANAGEMENT PROGRAMME
FOR THE COASTAL AREA OF

FUKA - MATROUH

PRESENTATION OF THE INTERMEDIATE RESULTS

MATROUH, 18, 19, 20 SEPTEMBER 1995
A chronological summary of the main events which led to the involvement of CTM RAC/ERS into the Fuka-Matruh CAMP is presented together with the main goals and benefits of the carried out work.

Then some outlines about the used methodology are illustrated, in particular as to the followed approach - which is an holistic and multidisciplinary one - the observation tools applied during the study, consisting in remotely sensed data and their validation and integration with in field direct controls.

As for the applied methodology, some descriptions about the main steps to be followed for its implementation are dealt with, stressing the usefulness and benefits of the various activities presented.

Afterwards the description of the carried-out work is proposed taking into account all the activities developed both in Italy - satellite data processing - in Alexandria - satellite image interpretation - and directly in the field, in the region of Fuka-Matruh, where several observations have been made concerning the land forms and the geomorphologic processes affecting the examined area, the natural vegetation distribution and classification, and the soil characteristics in properly made soil profiles. In particular as far as the image interpretation and the field survey phases are concerned, a group of four Egyptian experts has been trained and made able to carry out a similar work autonomously both in the same region in order to complete the field controls and in other similar areas.

Finally, some recommendations are proposed about the accomplishment of the work through the full involvement of the Egyptian experts and the possible integration of the acquired results with those produced by other RACs and the PAP/RAC in particular.
1) Background

From October 1992 (Agreement MAP-Egypt) to October 1993 (Antalya)

Conceiving, planning and setting up of RAC/ERS' intervention

1st Preparatory Mission to Egypt - June 1994

Consultations and cooperations - Starting of the works.

2nd Mission to Alexandria and Matrouh December 1994: Preparation of the Operations in Egypt


2) Presentation of the activities

Description of the applied methodology

Implementation of the work

Processing and interpretation of the satellite data

Field survey

Training-on-the-job

3) Remarks and recommendations

Problems arisen in the carrying out of the activities

Further development of the works: cooperation with Egyptian experts, with Egyptian Organizations, with other RACs

Final expected results

Other activities of RAC/ERS in Egypt and possible synergies
1) Background - From October 1992 to October 1993

OCTOBER 1992: AGREEMENT MAP - EGYPT

MARCH 1993: TWO-MONTH TRAINING COURSE FOR TWO EGYPTIAN EXPERTS IN ITALY (ROME/PALERMO)

1) Background - Conceiving, planning and setting up of the intervention

OBJECTIVE: Even if not included in the agreement of Fuka Camp, RAC/ERS decided to commit at once itself in this and in all the other planned activities of the map.

ACTION: RAC/ERS proposed three fields for its intervention in the framework of the Fuka Camp, according with the main issues of the area.

RESULT: The assessment of land resources with reference to soil erosion and desertification was selected in accordance with MEDU and EEAA.

The feasibility study was rapidly carried out.
1) Background - First preparatory mission to Egypt

JUNE 1994

A JOINT MISSION PAP/RAC - RAC/ERS WAS ARRANGED.

THE SCOPE OF RAC/ERS WAS TO SET THE TERMS FOR A DETAILED PLAN OF ACTIONS. SYNERGIES WITH THE STUDY OF SOIL PERFORMED BY PAP/RAC WERE ALSO ANALYZED.

MEETINGS WITH EEAA, WITH THE INSTITUTE OF GRADUATE STUDIES AND RESEARCH AND WITH THE FACULTY OF AGRICULTURE OF THE UNIVERSITY OF ALEXANDRIA, WITH THE LUPEM STATION, ALLOWED THE BEST FRAMING OF THE RAC/ERS' INTERVENTION.
1) Background - Consultations and cooperations: starting of the works

FOCUSING OF THE WORK

A detailed executive plan was drawn out, focused mainly on a twofold objective:

- Carrying out of a pilot project
- Transfer of know-how and methodologies through a training-on-the-job

COOPERATION

An agreement with IAO was set up

CONSULTATIONS

Further contacts with MEDU, EEAA and the Institute of Graduate Studies and Research (September)

STARTING OF THE WORKS

Satellite data relevant to the studied area were acquired and processed
1) Background - 2nd mission to Alexandria and Matrouh

DECEMBER 1994

2ND MISSION OF TWO EXPERTS FROM RAC/ERS

OBJECTIVES

PRESENTATION OF THE ACTIVITIES AND OF THE METHODOLOGY

CHECKING OF THE COMPATIBILITY OF HW/SW OF THE INSTITUTE LABORATORY

APPOINTMENT OF THE TRAINEES

LOGISTIC AND ADMINISTRATIVE ASPECTS

SURVEY OF THE AREA UNDER STUDY

PLANNING OF THE NEXT OPERATIONAL MISSION
1) Background - 3rd mission to Alexandria and Matrouh

THE 3RD MISSION PLANNED FOR JANUARY/FEBRUARY 1995, WAS DELAYED TO JUNE 1995

TRAINING-ON-THE-JOB

FIELD SURVEY
OVERALL METHODOLOGY

AIMS OF THE WORK

IMPLEMENTATION OF A MULTIDISCIPLINARY STUDY FOR THE ASSESSMENT OF NATURAL RESOURCES

PROVIDING THE EGYPTIAN AUTHORITIES WITH AN EFFECTIVE TOOL FOR SETTING UP AND PLANNING MEASURES DEVOTED TO "SOIL CONSERVATION"

TRANSFERREING OF THE APPLIED METHODOLOGY TO LOCAL EXPERTS THROUGH THEIR DIRECT INVOLVEMENT IN THE ACTIVITIES
OVERALL METHODOLOGY

APPROACH

HOLISTIC APPROACH
(FROM THE GREEK OLOS = ALL COMPLETE)
LAND AS THE RESULT OF A DYNAMIC, INTEGRATED
SYSTEM OF COMPONENTS, INCLUDING MAN AND HIS
ACTIVITY

MULTIDISCIPLINARY APPROACH
APPLICATION OF DIFFERENT DISCIPLINES AND
EXPERTISE DUE TO THE INTERRELATIONS EXISTING
WITHIN THE NATURAL RESOURCES COMPLEX
 ENVIRONMENT)

NO COMPUTER AUTOMATIC CLASSIFICATIONS ARE
MADE, THE INTERPRETATION OF THE REMOTELY SENSED
IMAGE MUST BE MADE BY SKILLED SCIENTISTS
SEPARATELY
OVERALL METHODOLOGY

LANDSCAPE GUIDED METHOD - ZONNEVELD ITC, ENSCHEDE (NL)

FOLLOWING THIS METHOD IN A STUDIED REGION, IT IS POSSIBLE TO IDENTIFY AREAS - LAND SYSTEMS - OF THE EARTH'S SURFACE SHOWING REPETITIVE LAY-OUT OF LANDFORMS AND/OR VEGETATION ASSOCIATIONS AND/OR SOIL USES

EACH REPETITIVE LAY-OUT REPRESENTS A SMALLER AREA CALLED LAND UNIT

ALL THE LAND UNITS OF A GIVEN LAND SYSTEM ARE LINKED TOGETHER ACCORDING TO GEOGRAPHICAL AND GEOMORPHOLOGICAL CRITERIA

CTM - RAC/ERS
OVERALL METHODOLOGY

OBSERVATION TOOLS

REMOTE SENSING AND/OR AERIAL PHOTOS

- ESSENTIAL TOOLS FOR THE APPLICATION OF THE USED METHODOLOGY
  THEY GIVE A KIND OF HOLISTIC IMPRESSION OF THE LAND REVEALING MUCH OF ITS TOTAL CHARACTERISTICS TO THOSE SCIENTISTS WHO HAVE FEELING FOR IT

FIELD SURVEY

- NO REMOTE SURVEY CAN BE CONSIDERED AN EFFECTIVE OPERATIVE TOOL WITHOUT THE DIRECT IN FIELD CONTROL OF THE INTERPRETED FEATURES
Table 1 - Block diagram of the implemented methodology
TRAINING COURSE

ATTENDANTS

FROM THE COLLEGE OF AGRICULTURE, SOIL AND WATER SC. DPT.

DR MOHAMED H. BANASSY

FROM THE INSTITUTE FOR GRADUATE STUDIES AND RESEARCH

DR KHALID MAHMOUD DEWIDAR
DR MAMDOUH MOHAMED EL HATTAB
DR AMED ZAKI SHALABI

LECTURERS

FROM THE ISTITUTO AGRONOMICO PER L'OLTREMARE

DR GIACOMO DELLI
DR MARIA LAURA VITI

FROM THE CTM RAC/ERS

DR SABINA CARNE MOLLA

CTM - RAC/ERS
TRAINING COURSE

STRUCTURE

THEORETICAL ASPECTS:
Methodologies for integrated survey
Exercises

FIELD SURVEY

IN FIELD DATA MANAGEMENT AND PROCESSING

AIMS

TO PROVIDE MULTIDISCIPLINARY INFORMATION ON
THE FUCA-MATRUH REGION

TO GIVE SUGGESTIONS FOR IMPLEMENTING
OTHER DERIVATIVE MAPS AND FOR EVALUATING
LAND SUITABILITY FOR EXTENSIVE GRAZING
PROGRAMME OF THE COURSE

Alexandria

5-6 June 1995

METHODOLOGIES FOR INTEGRATED SURVEYS
The concept of Land Resource
Physical land resources (geomorphology, climate and water), physical-biological land resources (soil) and biological land resources (vegetation, fauna, man)
Reasons for land resources surveys and evaluation
The IAO Methodology: the holistic approach and the concept of Land System and Land Unit
Main steps in an integrated land resources assessment
Some practical application of the IAO methodology

7-12 June 1995

EXERCISES
Overview on the Fuka Matrouh natural resources: climate, geology and geomorphology, soil, water, present land use and vegetation (carried out by the students).
Integrated Natural Resources survey planning: definition of the aims, mapping scale definition and preparation of a preliminary legend.
Fact-sheet compilation.
Preliminary image interpretation: definition of the main cartographic units (one interpretation for each student) by visual observation and through the support of image processing.
Merging of the different image interpretations into one single sheet.
Stratification of ground checkpoints

13 June 1995

Transfer to Marsa Matrouh
Fuka-Matruh area

14-21 June 1995

FIELD SURVEY
Searching of the most representative point of the cartographic unit
Carrying out of the survey and compilation of the geo-morphological, pedological, vegetational fact-sheets
Periodical meetings about the state of the work

21 June 1995
Transfer to Alexandria

Alexandria

22-24 June 1995

FIELD DATA MANAGEMENT AND PROCESSING
Revision of the image-interpretation
Building up of a data-base on natural resources of the Fuka-Matruh area
Data input and storage
Overview of the necessary steps in order to complete the work
### PRELIMINARY LEGEND

#### COASTAL PLAIN

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Beach and drifting oolitic sediments</td>
</tr>
<tr>
<td>C2</td>
<td>Foreshore ridge</td>
</tr>
<tr>
<td>C3</td>
<td>Ridges and inter-ridges areas</td>
</tr>
<tr>
<td>C4</td>
<td>Salt marshes</td>
</tr>
<tr>
<td>C5</td>
<td>Ridges and highly saline inter-ridges</td>
</tr>
<tr>
<td>C6</td>
<td>Alluvial plain formed by scattered alluvial fans</td>
</tr>
<tr>
<td>C7</td>
<td>Aeolian sand dunes</td>
</tr>
<tr>
<td>C8</td>
<td>Complex area with alluvial plain and long, branched wadies</td>
</tr>
<tr>
<td>C9</td>
<td>Alluvial plain covered by aeolian deposits</td>
</tr>
<tr>
<td>C10</td>
<td>Almost flat plain without drainage network</td>
</tr>
</tbody>
</table>

#### ESCARPMENT

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
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</thead>
<tbody>
<tr>
<td>E1</td>
<td>Very steep slope and gentle slope escarpment</td>
</tr>
<tr>
<td>E2</td>
<td>Gentle slope escarpment</td>
</tr>
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#### NORTHERN PLATEAU

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP1</td>
<td>Undulating hills and depressions</td>
</tr>
<tr>
<td>NP2</td>
<td>Rocky plateau</td>
</tr>
<tr>
<td>NP3</td>
<td>Rocky plateau with aeolian deposits</td>
</tr>
<tr>
<td>NP4</td>
<td>Rocky plateau with shallow soils</td>
</tr>
<tr>
<td>NP5</td>
<td>Rocky plateau with depressions (sink holes)</td>
</tr>
<tr>
<td>NP6</td>
<td>Rocky plateau with wadies</td>
</tr>
</tbody>
</table>

#### SOUTHERN PLATEAU

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1</td>
<td>Southern plateau</td>
</tr>
<tr>
<td>SP2</td>
<td>Southern plateau darker in colour</td>
</tr>
<tr>
<td>SP3</td>
<td>Southern plateau with rocky outcrops</td>
</tr>
</tbody>
</table>
# GEOMORPHOLOGY

## RELEVE N. [Blank]

### Coordinates
- N [Blank]
- E [Blank]

### Date
[Blank]

### Surveyors
[Blank]

### Location
[Blank]

### Preliminary Code
[Blank]

### Final Code
[Blank]

### Cartographic Code
[Blank]

## Site Description

### Elevation (m)
[Blank]

### Exposure (°)
[Blank]

### Site Position
[Blank]

### Slope Form
[Blank]

### Slope Gradient (%)
[Blank]

### Slope Length (m)
[Blank]

### Crest Form
[Blank]

### Valley Form
[Blank]

### Relief Intensity (m)
[Blank]

### Surf. Soil Colour
[Blank]

### Landuse
[Blank]

### Vegetation
[Blank]

### Human Influences
[Blank]

### Parent Material
[Blank]

### Rock Outcrops
[Blank]

### Coarse Fragments Abund
[Blank]

### Coarse Fragments Size
[Blank]

### Effective Soil Depth (cm)
[Blank]

## Land Facet Description

### Elevation Range (m)
[Blank]

### Relief Type
[Blank]

### Surface/Groundwater
- Surface Inundation
- GW Depth (cm)
- GW Flouridan (cm)

### Water Point Type
[Blank]

### WR Latitude (UTM)
[Blank]

### WR Longitude (UTM)
[Blank]

### Rock
- Lithology
- Structure

### Frequency
[Blank]

### Flood
- Duration
- Area

### Erosion Type
- Sheet
- Rill
- Gully
- Ravine

### Exposed Roots Height
[Blank]

### Conservation Practices
- Plan
- Drainage Ways

### Aggradational Type
- Area
- Rate

### Synthesis
- Geology
- Relief
- Geomorphological Unit
- Active Processes
- Etc.
**SOIL**

**COORDINATES N**

**DATE**

**SURVEYORS**

**LOCATION**

**A. PHOTO N°**

**TOPO MAP**

**PRELIMINARY CODE**

**FINAL CODE**

**CARTOGRAPHIC CODE**

---

**SITE DESCRIPTION**

<table>
<thead>
<tr>
<th>ELEVATION (m)</th>
<th>EXPOSURE (*)</th>
<th>SITE POSITION</th>
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<tbody>
<tr>
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</table>

<table>
<thead>
<tr>
<th>SLOPE FORM</th>
<th>SLOPE GRADIENT (%)</th>
<th>SLOPE LENGTH (m)</th>
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<tbody>
<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>LANDUSE</th>
<th>VEGETATION</th>
<th>HUMAN INFLUENCES</th>
<th>PARENT MATERIAL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>ROCK OUTCROPS</th>
<th>COARSE FRAGMENTS</th>
<th>EFFECTIVE SOIL DEPTH (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
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**SOIL PROFILE DRAFT**

<table>
<thead>
<tr>
<th>0</th>
<th>25</th>
<th>50</th>
<th>75</th>
<th>100</th>
<th>125</th>
<th>150</th>
<th>175</th>
<th>200</th>
</tr>
</thead>
</table>

**SEALING -thickness-**

**SEALING -consistency-**

<table>
<thead>
<tr>
<th>CRACKS -width-(cm)</th>
<th>CRACKS -distance-(cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

**MICRO-TOPOGRAPHY**

<table>
<thead>
<tr>
<th>TYPE</th>
<th>HIDDEN</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tbody>
</table>

**DRAINAGE**

<table>
<thead>
<tr>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>
### REVISED LEGEND

#### COASTAL PLAIN

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Beach and drifting oolitic sediments</td>
</tr>
<tr>
<td>C2</td>
<td>Ridges and inter-ridges areas</td>
</tr>
<tr>
<td>C3</td>
<td>Discontinuous ridges and inter-ridges areas</td>
</tr>
<tr>
<td>C4</td>
<td>Salt marshes</td>
</tr>
<tr>
<td>C5</td>
<td>Ridges and highly saline inter-ridges areas</td>
</tr>
<tr>
<td>C6</td>
<td>Coastal plain with scattered alluvial fans</td>
</tr>
<tr>
<td>C7</td>
<td>Undulating area covered by aeolian deposits</td>
</tr>
<tr>
<td>C8</td>
<td>Deep wadies and inter-wadies areas</td>
</tr>
<tr>
<td>C9</td>
<td>Almost flat area without drainage network</td>
</tr>
</tbody>
</table>

#### NORTHERN PLATEAU

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP1</td>
<td>Undulating hills and depressions</td>
</tr>
<tr>
<td>NP2</td>
<td>Plateau without aeolian deposits</td>
</tr>
<tr>
<td>NP3</td>
<td>Plateau with aeolian deposits</td>
</tr>
<tr>
<td>NP4</td>
<td>Plateau with cultivated fields</td>
</tr>
<tr>
<td>NP5</td>
<td>Plateau with shallow depressions</td>
</tr>
<tr>
<td>NP6</td>
<td>Transitional plateau</td>
</tr>
<tr>
<td>NP7</td>
<td>Dissected plateau with incised wadies</td>
</tr>
<tr>
<td>NP8</td>
<td>Dissected plateau with shallow drainage lines</td>
</tr>
</tbody>
</table>

#### SOUTHERN PLATEAU

<table>
<thead>
<tr>
<th>CODE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP1</td>
<td>Plateau with rock outcrops</td>
</tr>
<tr>
<td>SP2</td>
<td>Plateau with higher vegetation cover</td>
</tr>
</tbody>
</table>

---

*table 5*
References


- MAP/UNEP, 1992 - Agreement relative to the coastal area management programme for the coastal area of Fuka-Matrouh (Egypt) - Co-ordinating Unit for the Mediterranean Action Plan Athens.


- VARIOUS AUTHORS, 1993 - Land Unit MAP of the Kebili area (Southern Tunisia) - XVI Corso di Telerilevamento e Valutazione delle Risorse Naturali - IAO Florence.

- WEBSTER 1971 - Webster's third new international dictionary of the English language - Merrion C. Co. Springfield (MASS) U.S.A.


- ??, 1993 - Up-dated on-site report for the Fuka-Matruh Area, Egypt - Fuka-Matruh CAMP, Egypt
3) Remarks and recommendations - Problems arisen

DELAY OF THE 3RD MISSION

If carried out as scheduled in January 1995, the result of the satellite data interpretation would have allowed a more effective cooperation with PAP/RAC for the field survey and in general a better synergy between the activities of the two RACS.

In June, the identification of the natural vegetation in the area is quite difficult.

In June weather conditions are not favourable for field surveyers.

LOGISTIC ASPECTS

Some transportation issues in the area of the study have been solved thanks to the cooperation of LUPEM.
3) Remarks and recommendations: Further development of the work

THE EGYPTIAN RESEARCHERS

SHOULD GO ON WITH THE FIELD SURVEY AND WITH THE LAND CLASSIFICATION

COULD INTEGRATE ALL THE OBTAINED INFORMATION AND DATA INTO THE DATA BASE SET UP BY PAP/RAC

EEAA AND THE INSTITUTE G.S.R.

SHOULD ENCOURAGE AND SUPPORT THE RESEARCHERS ALLOWING THEM TO COMPLETE THESE ACTIVITIES
3) Remarks and recommendations: Final expected results

RAC/ERS

IF THE ABOVE MENTIONED DEVELOPMENT BE AGREED UPON, RAC/ERS COULD PLAN ANOTHER MISSION TO EGYPT IN ORDER TO ASSIST RESEARCHER IN DRAWING UP THE LAND UNIT MAP OF THE WHOLE AREA OF THE CAMP

IS AVAILABLE TO STRENGTHEN FURTHER COOPERATION WITH EGYPTIAN ORGANIZATION FOR THE APPLICATION OF THE SAME METHOD IN AREAS OF INTEREST AND THE ARRANGEMENT OF TRAINING COURSES
3) Remarks and recommendations: Other activities of RAC/ERS in Egypt

VISITED EGYPTIAN ORGANIZATIONS

INSTITUTE OF GRADUATE STUDIES AND RESEARCH, UNIVERSITY OF ALEX. PROF M. EL RAEY, DEAN

UNIVERSITY OF ALEXANDRIA, FACULTY OF AGRICULTURE PROF FAWZI H. ABD EL KADER

NATIONAL AUTHORITY FOR REMOTE SENSING AND SPACE SCIENCES, CAIRO PROF. M. ABDEL-HADY, PRESIDENT DR. HUSSEIN A. YOUNES, V. PRES.

DESERT RESEARCH CENTER - CAIRO PROF. M. A. ETMAN - PRESIDENT PROF. M. SAMI SOLIMAN - HEAD OF SATELLITE STATION

CEDARE MR. KAMAL A. SABET, CHIEF TECHN. ADVISOR DR. ADEL FARID, INF. SERV. UNIT

LUPEM STATION MR. SHERIF MOUSTAFA (OFF. IN CH.)

CONTACTS GEO/MAP CONSULTANTS - CAIRO MR. MOSHEN BADAWY, DIRECTOR (SOIL AND WATER RESEARCH INST. DR. NABIL EL MOWELHI, DIRECTOR)
3) Remarks and recommendations: Other activities of RAC/ERS in Egypt

**PROJECT DAPHNE**
MULTITEMPORAL OBSERVATION OF VEGETATED AREAS BY SATELLITE ALL OVER THE MEDITERRANEAN COASTAL COUNTRIES

**RAIS PROJECT**
INVENTORY OF REMOTE SENSING ACTIVITIES AND CENTERS IN THE MEDITERRANEAN REGION

**COSMOS PROJECT**
IDENTIFICATION OF ENVIRONMENTAL ISSUES OF PRIORITY INTEREST FOR THE MEDITERRANEAN REGION, AND THE RELEVANT ENVIRONMENTAL PARAMETERS MONITORABLE THROUGH THE USE OF REMOTE SENSING TECHNIQUES.

**SUDDAN PROJECT**
MONITORING OF THE DYNAMIC OF THE DESERTIFICATION IN NORTHERN AFRICA.
TO BE SET UP IN COOPERATION WITH OSS, CRTEAN, IMAGEO, SCOT CONSEIL, IPI-UH - WITH THE PARTICIPATION OF EGYPT, LIBYA, ALGERIA, MAURITANIA, ALGERIA, TUNISIA.
ANNEX XII

RECOMMENDATIONS
ANNEX XII

RECOMMENDATIONS

The following preliminary general recommendations are directed to the Egyptian authorities and to the Coordinating Unit for the Mediterranean Action Plan.

1. **Pursue and strengthen** the involvement of local experts in CAMP activities.

2. **Integrate** available data, information and reports, prepared so far through individual activities and identify gaps of knowledge, into a synthetic document to be the preliminary step towards the preparation of a Coastal Area Management Plan for the Fuka-Matrouh area.

3. **Give** proper consideration to LBS/monitoring, shoreline and marine ecosystems, as well as to solid and **liquid** wastes issues.

4. **Give** more consideration to the historic sites in the area, based on already achieved work by SPA/RAC, through the involvement of MAP's Network for historic sites located in the Atelier du Patrimoine, of Marseille.

5. **Ensure** proper coordination and cooperation through local and national experts, between CAMP project and existing on-going activities (QASR, LUPEM, WB, etc...) in order to come out with a real added value.

6. **Take** the necessary steps to organize a training seminar on environmental legislations directed to local actors, under the direction of Matrouh Authorities and in cooperation with EEAA.

7. **Take** the necessary steps to establish a Fuka-Matrouh Database and GIS, involving local, national and international expertise.

8. **Invite** all concerned partners in this CAMP to finalize their activities in view of presenting the final results around middle of 1996.

9. **Translate** the documents presented so far into Arabic in order to make them more useful to local actors.
ANNEX XIII

LIST OF REPORTS AND STUDIES
ANNEX XIII

LIST OF REPORTS AND STUDIES

MED UNIT

- Agreement relevant to the Coastal Area Management Programme for Fuka-Matrouh Area - 1992

- First progress report on the implementation of the Fuka-Matrouh CAMP (January - September 1993)

- Second progress report on the implementation of the Fuka-Matrouh CAMP (October 1993 - December 1994)

- A legal study of Environmental Legislations relating to the Fuka-Matrouh Area project - 1994
  By: Mr. M. El-Gindi and Ms. M. Zuficar

- Report on the implications of climatic changes on the Coastal Area of Fuka-Matrouh - 1995

BP/RAC

- A framework for Accumulating Consequential Data and knowledge - 1995
  By: Mr. M. Ayyad

- Systemic and prospective analysis for an environmentally friendly management - 1995
  By: Mr. C. Aruoba

- Framework on environmental problems and management - 1995

- Framework on environmental problems and management - 1995
  By: Mr. K. Fahmi

PAP/RAC

- Report concerning tourism carrying capacity study of the Fuka-Matrouh Area - 1993
  By: Mr. M. Dragicevic

  Mr. F. Surucu
Report concerning soil erosion and desertification - 1994
By: Mr. G. Ferrari

Guidelines for integrated management of coastal and marine areas (with special reference to the Mediterranean basin) - 1995
By: PAP/RAC - OCA/PAC

SPA/RAC

The terrestrial ecosystems of Fuka-Matrouh Area - status, protection and management measures - 1993
By: Mr. M. Ayyad

The marine ecosystems of Fuka-Matrouh Area - status of species and habitats - 1993
By: Mr. A. Beltagy

Marine turtles conservation in the Mediterranean - Marine turtles in Egypt (phase I) - Survey of the Mediterranean coast between Alexandria and El-Salums - 1993
By: Mr. M. Kasparek

Cultural heritage sites of the North-western coastal area of Egypt - 1995
By: Mr. F. Ismael

ERS/RAC

Assessment of land resources supported by remote sensing for the Coastal Area of Fuka-Matrouh - 1995