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MAP CAMP PROJECT "FUKA-MATROUH", EGYPT

FINAL INTEGRATED REPORT AND SELECTED DOCUMENTS

MAP Technical Reports Series No. 131
Volume I

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The thematic structure of the MAP Technical Series is as follows:

- Curbing Pollution
- Safeguarding Natural and Cultural Resources
- Managing Coastal Areas
- Integrating the Environment and Development

This series contains selected reports resulting from the various activities performed within the framework of the components of the Mediterranean Action Plan: Pollution Monitoring and Research Programme (MED POL), Blue Plan (BP), Priority Actions Programme (PAP), Specially Protected Areas (SPA), Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), Environment Remote Sensing Centre (ERS), and Cleaner Production Centre (CP).

MAP CAMP PROJECT "FUKA-MATROUH", EGYPT

FINAL INTEGRATED REPORT AND SELECTED DOCUMENTS

Volume I

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Technical Note

This issue of MAP Technical Report Series presents a selected set of documents prepared within the MAP CAMP "Fuka-Matrouh-Egypt" project. Each CAMP project includes a number of individual project activities, prepared by national experts and/or institutions with the assistance and guidance of respective MAP Centres. The outputs of these activities are usually presented by final documents or final activity reports, each report containing 80 – 200 pages, and sometimes even more, including a number of maps, figures and technical annexes.

Therefore, it was not possible to present all project outputs in one issue of MAP Technical Report Series. The selection of the documents to be included was made by PAP/RAC, with the consent of the National Focal Point for Egypt and of the MAP Co-ordinating Unit. Due to the number of selected documents the issue had to be published in two volumes.

The first volume contains the Final Integrated Report of the project and the Report of the Final Presentation Conference, both documents presenting the synthesis of project results, and, as annexes, the final documents of the activities related to Integrated Coastal Area Management, Strategic Environmental Assessment, and Carrying Capacity Assessment.

The second volume contains documents relative to the activities on Systemic Prospective Analysis, Soil Degradation and Desertification, Assessment of Natural Resources and Soil Conservation Issues, Sites of Cultural Heritage, and Marine Ecosystems.

In addition, both volumes contain a preface, introduction and the list of all final outputs of the project.

All documents are presented in their original form.

PREFACE

The MAP Coastal Area Management Programme (further on referred to as CAMP or Programme) has been approved by the Sixth Ordinary Meeting of the Contracting Parties, held in Athens in 1989. Its adoption was preceded by four coastal management pilot projects, implemented by PAP/RAC in the 1987-1989 period.

During the 1989-2001 period eight CAMP projects were implemented in: Albania (the Albanian Coast), Croatia (the Kastela Bay), Egypt (the Fuka-Matrouh Coastal Area), Greece (the Island of Rhodes), Israel (the Israeli Coast), Syria (the Syrian Coastal Area), Tunisia (the Sfax Coastal Zone), and Turkey (the Izmir Bay). Presently, the CAMP "Malta" project is in implementation (since early 2000), the project for Lebanon started in 2001, and the project for Algeria is in preparation, likely to start in the year 2001 or early 2002. Finally, projects for Morocco and Slovenia are in preparation, to start in 2002 or later on.

Within the initial phase of CAMP, the MAP Co-ordinating Unit in Athens was responsible for the Programme as a whole and for the implementation of its individual projects. Since 1996 PAP/RAC has been the MAP Centre responsible for the co-ordination of the CAMP, under the supervision and guidance of the Co-ordinating Unit.

The conceptual framework of MAP CAMP is based on the principles of sustainable development and on Integrated Coastal Area Management (ICAM). The Programme performs practical coastal management projects in areas selected in accordance with the Programme objectives and defined criteria. The projects are implemented by MAP in co-operation with the responsible national and local authorities and institutions, by selected national teams or institutions, with the assistance of respective MAP Centres and MED POL.

The objectives of the Programme are:

a) to develop strategies and procedures at local and national levels for sustainable development, environment protection, and rational utilisation of coastal and marine resources, to be also used as inputs for the formulation of Mediterranean strategies of sustainable development,
b) to identify, adapt, and test, in a realistic operational context, methodologies, tools and practices of sustainable coastal management in the region,
c) to contribute to the upgrading of relevant national/local institutional and human capacities, and
d) to secure a wider use, at national and regional levels, of experience achieved by the Programme and by its individual projects, and create conditions for follow-up activities.

The Programme is of a multilevel nature, being oriented at local/project area level by dealing with area-specific priority problems, and at national and regional levels by applying the project results and experience as pilot ones.

Individual CAMP projects are structured into project units defined as individual project activities, each activity dedicated to a specific issue or to an interrelated multisectoral group of issues. Integration and co-ordination, data management, sustainability analysis, and a public participation programme are considered as mandatory activities of each CAMP project.

INTRODUCTION

The CAMP "Fuka-Matrouh-Egypt" project has been approved by the Seventh Ordinary Meeting of the Contracting Parties to the Barcelona Convention, held in 1991 in Cairo. The Agreement on the development and implementation of the project was signed in November 1992, and after the preparatory phase, the implementation started in 1993.

The project area was defined at two levels, the North - Western Mediterranean Coast of Egypt as the wider geographical context, and the Fuka-Matrouh area as the project study area. The wider project area administratively belongs to the Matrouh Governorate. The boundaries of the project study area are defined by the city of Matrouh at the western end, the Fuka area at its eastern end, the Mediterranean Sea in the North, and in the South by the 100 m contour line, resulting in a line 10-20 km distant from the coastline. The length of the coastline of the study area is approximately 100 km. The project study area is representative of the wider Mediterranean coastal region of Egypt, being scarcely populated, with Bedouin population in rural areas and immigrant population in the towns. The coastal strip and the adjacent marine area might be considered as among the most attractive natural sites of the Mediterranean. The area is also rich in valuable cultural heritage.

In spite of its great value and significance the area faces serious threats. In addition to the degradation which occurred over the centuries due to historic events, the fragile and sensitive ecosystems are presently under permanent pressure of uncontrolled development of tourism, inappropriate agricultural practices, absence of effective land-use and development planning, and insufficient integration of policies. It should also be noted that the national development policy aims at strengthening of development processes leading to a faster sustainable development of the area, providing increased employment opportunities for the resident population and for the expected further immigrants from the Nile area. Finally, there is a need for a better understanding of present and future development impacts on Bedouin population, now predominantly settled.

Taking all of the above into consideration, the long-term objectives of the project were to propose a sustainable development concept, and to create conditions for the establishment of the process of integrated planning and management of the project area. The immediate objective of the project was to propose solutions for urgent problems in the area, taking into account the long-term objectives of the project.

Accordingly, the project Agreement envisaged the implementation of 10 individual activities:

- systemic and prospective analysis,
- study on implications of expected climate change,
- integrated planning and management study,
- training and application of tools for integrated coastal management: GIS, Carrying Capacity Assessment for tourism activities, and EIA,
- development of environmental legislation and institutional framework,
- inventory of land-based sources of pollution, monitoring and research of marine pollution,
- study on protected areas and implementation of the Specially Protected Areas protocol,
- study on development of tourism,
- assessment of soil erosion and desertification, and
- water resource management study.

It was understood that the ICAM methodology would be applied by the project providing, among others, for integration of the project results into an integrated final project document.

The implementation of the project was completed in 1998, the final project documents presented in 1999, and the Final Presentation Conference held in June 1999. The MAP Co-ordinating Unit was responsible for general co-ordination and implementation of the project till the end of 1995. Since 1996 the Unit acted as the overall supervisor, providing guidance for the project implementation, while PAP/RAC, BP/RAC, SPA/RAC, ERS/RAC and MED POL were responsible for the implementation of activities within their mandates. From 1996 PAP/RAC was responsible for the co-ordination and implementation of all project activities, under the guidance and supervision of the Co-ordinating Unit.

The institutional arrangements at host-country level included the involvement of the Ministry of State for the Environment, the Egyptian Environmental Affairs Agency (EEAA), the Governorate of Matrouh and local communities, the Ministry of Tourism, and the National Authority for Remote Sensing and Space Sciences (NARSS). A large part of project activities was implemented by the University of Alexandria, Institute for Graduate Studies and Research, and by national teams, assisted by MAP Centres and experts. In addition, within individual activities, NGOs, the private sector, major stakeholders and the local population were involved.

It can be said that the activities and results of the project represent a milestone in the national coastal management programme, by introducing innovative methodologies and tools, establishing partnerships and involving stakeholders, and by a successful implementation of integrating activities (Integrated Planning, GIS and Database, Strategic Environmental Assessment, and Sustainable Prospective Analysis). In addition, the replicability of approaches, methodologies and tools applied enables the implementation of similar initiatives in other equally sensitive areas.

The sustainable development framework till the year 2020, elaborated for the project area proposes a spatial development concept consisting of: (i) mixed use, peri-urban villages east and west of the Matrouh city, (ii) tourism facilities in the forefront project area, (iii) residential rural areas behind, and (iv) agriculture and light industry facilities close to main transport corridors.

The sustainable tourism development programme was elaborated using the Carrying Capacity Assessment as a tool. The recommended development concept consists of: (i) identification of sensitive areas and elaboration of measures and actions for their protection (restricted development, buffer zones, access regulation), (ii) identification of areas for, and types of tourism facilities to be developed, (iii) measures to extend the tourism season duration, and (iv) support of the local population and expression of interest to be involved in such a tourism development concept.

The assessment of soil degradation and desertification processes was made by a successful use of the remote sensing technique, combined with field surveys, resulting in recommendations for conservation of resources and implementation of appropriate control management procedures.

Sites of particular natural and cultural value were identified and evaluated, measures and recommendations for their protection and sustainable use were formulated concerning their legal status, a network of protected areas was established, as well as a surveying system of marine ecosystems, and specific measures for the protection of the cultural heritage

The study on terrestrial ecosystems, in addition to a detailed inventory and assessment of the status and problems of these systems, recommended: (i) pilot areas for protection and controlled grazing, involving land-users and local authorities, to be established, (ii) systems for grazing management to be initiated, involving land-users and local authorities, (iii) extensive programmes for the propagation of protection of endangered plant species to be developed, and (iv) nature reserves to protect the representative habitats to be established and managed.

The Systemic Prospective Analysis indicated the trends and alternative options, in addition to the introduction of the relevant approaches and methodology into national practice.

Finally the project resulted in the identification of implications of the climate change and elaboration of respective recommendations, and provision of data, information and recommendations related to marine pollution.

The Final Presentation Conference and the final activity documents formulated a number of recommendations, to be taken into account when deciding on the use of project results and its follow up (see Annex Vi of the Conference Report, later in the text).

Finally, among recommendations formulated by the project, some issues to be dealt with as part of follow-up activities, might be mentioned:

- the use of the project results when elaborating and adopting plans and development programmes for the project area,
- the presentation of project results to the National Committee for ICZM,
- strengthening of institutional capacities for the implementation of large, complex, multidisciplinary projects, implementation of respective measures for capacity building,
- development of a land information system, to be used as input for land-use and development planning,
- preparation of a study on the position of Bedouins and impact of the development on their future in the project area, and
- implementation of other recommendations related to institutional and legal measures and protection / rehabilitation activities, as appropriate.

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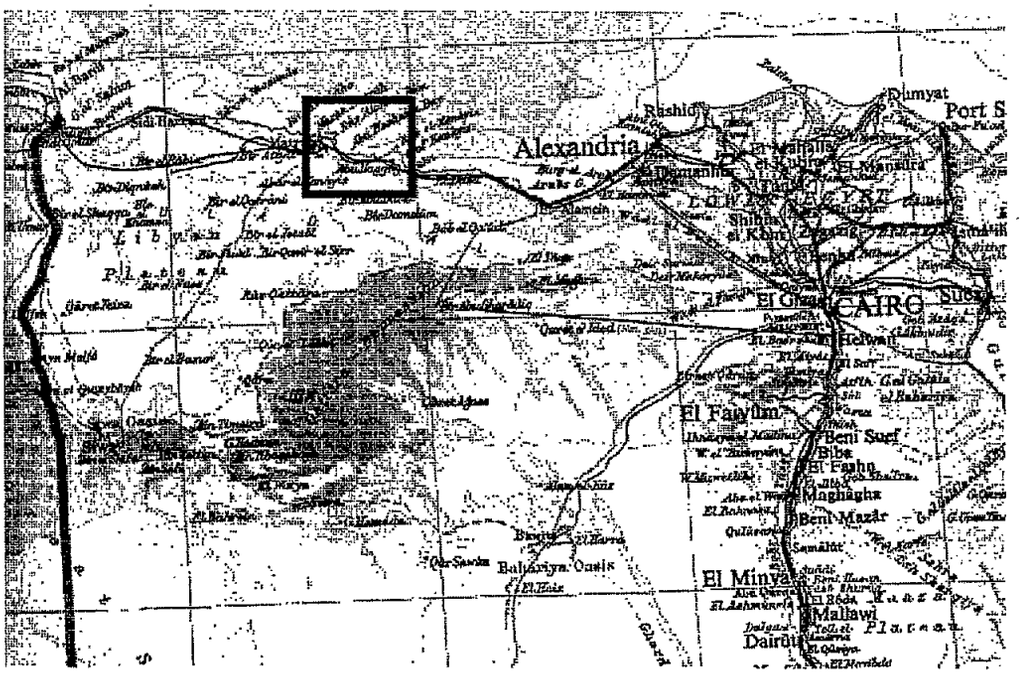
Coastal Area Management Programme (CAMP)
FUKA-MATROUH - Egypt

FINAL INTEGRATED REPORT



Priority Actions Programme
Regional Activity Centre
Split, June 1999

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Executive Summary

CAMP is the MAP programme with the objective to develop planning and management strategies for a sustainable development of Mediterranean coastal and marine resources. As such, the Programme promotes and supports national coastal management initiatives building relevant institutional and human capacities.

The Programme provides, and it was doing so in Egypt, to all MAP RACs and MEDPOL the opportunity of a harmonized joint practical work with the host country national and local authorities, institutions and scientific community, demonstrating the capacity for integration and application of best methodologies and tools in real conditions.

According to the Agreement between Egyptian Government and MAP, signed in 1992, MAP agreed to implement the Project, in order to tackle major problems and issues in the Fuka-Matrouh area. It was important that proposed study area with its problems and concerns appeared to be enough representative of the wider Mediterranean coastal region of Egypt. The main issues include:

- Uncontrolled development of tourism (intended for domestic market as summer houses) which mostly excludes local population as beneficiares while producing negative impacts on natural environment and infrastructure.
- Complex natural conditions that require sensible agricultural policies, whose main beneficiaries should be native population, Beduins.
- Ecologically and environmentally sensitive areas, as well as valuable cultural heritage.
- Absence of an effective land-use planning and development control system, as well as of a participatory approach in overall development planning.

Accordingly, the long-term objective of the Project was setting up of the system of integrated planning and management of resources in the area, as well as to support efforts towards the development of a national coastal management programme. The immediate objective of the Project was to provide solutions to development and environment problems of the most urgent nature which could be implemented in short run.

As a matter of fact, during the Project implementation the Framework ICZM Programme for Egypt, in year 1996 was prepared. It defined the basic institutional and legal arrangements, and the Fuka-Matrouh Project and the ICAM Planning Study fit into that framework. The communication between the Fuka-Matrouh Project and the on-going national ICZM Programme were made easy by the fact that EEAA was in charge of co-ordinating both the overall national ICZM activities and the activities of the national team working on the Fuka-Matrouh Project.

The Project was composed of two groups of activities: those primarily sectoral, focused on individual topics or issues which mostly make the analytical part of the planning process, and the activities which integrate the information and knowledge gained in the analytical phase in outputs, such as CCA, ICAM Planning Study and SEA.

The first group produced as comprehensive, precise and value-free information as possible to support decision and policy making in the second stage of the planning process. The second

phase of the planning process synthesised the collected information and produced an integrated physical development strategy at a regional level (ICAM Planning Study), and formulated a management strategy including legal and institutional aspects, as well as action plans.

With regard to the individual activities, some of them brought in innovative methodologies and tools that proved to be useful and applicable, such as:

- assessment of land resources - characterized by holistic approach and methodology that combined high-tech remote sensing technologies with field surveys and laboratory work to produce valuable and cost-effective information,
- strategic environmental assessment (SEA) - an important issue in case of the coastal development of the Fuka-Matrouh area was a need to ensure tools to assess not only the individual project impacts within the usually very limited geographic area, but also whole development programmes or plans covering wider coastal segments (i.e. additive impacts of tourist villages in the whole Fuka-Matrouh coastal strip).

Integrated Coastal Area Management (ICAM) Planning Study is the main ouput that synthesized all the knowledge and recommendations gained by individual activities and sectoral studies. The development concept proposed in this Study and shown only within the study area boundaries is the result of the considerations of the wider regional and national context. This concept envisages the creation of an important development pole in the western coastal region. Instead of individual tourist resort projects sneaking into the coast and silently using it up, mostly excluding the local population as beneficiaries, the proposed concept aims at a comprehensive development of the western coastal region. This regional development concept has the following main objectives:

- to support the national policies such as population decentralization from overpopulated Nila valley and equitable distribution of international tourist development benefits nation-wide,
- to introduce measures and technologies to develop most of the land suitable for agriculture (including the restoration of rangeland) to revitalize rural, mostly Bedouin communities, and take advantage of their intimate knowledge of this environment,
- to ensure diversification of the tourist product and activities (larger share of commercial and international tourism) providing for more jobs in tourism as well as in other tourism related sectors,
- to ensure protection of the area's natural and cultural heritage.

The Fuka-Matrouh area is a good example of the area where an integrated coastal management plan is needed because of negative development trends, conflicting issues and complex management problems. One of the project key words is integration. It is equally needed during the planning process – horizontal integration – when relevant authorities and disciplines have to cooperate as well as at implementation stage – so called vertical integration – when different levels of government should pull together.

To this end, an important project recommendation is that the power of the existing line agencies should be balanced with the **real operational powers of co-ordinating bodies** such as the National Committee for ICZM.

While the Fuka-Matrouh project has provided a comprehensive scientific and technical analysis, and proposed an ambitious, intensive and knowledge based regional development concept, there are, as just mentioned, numerous administrative and socio-political issues that should be resolved if the coastal management goals are to be achieved.

1. GENERAL INFORMATION ON MAP COASTAL AREAS MANAGEMENT PROGRAMME (MAP CAMP)

Context

CAMP is the MAP programme for sustainable coastal management, integrating environmental concerns into development planning and practice, oriented at understanding and resolving practical environmental, development and management problems at local and national levels in Mediterranean coastal areas.

The geographic context of the Programme is defined by the Barcelona Convention, and encompasses the Mediterranean marine environment and its coastal and watershed areas.

Programme Objectives

The objectives of the Programme are:

a) to develop strategies and procedures at local and national levels for a sustainable development, environment protection and rational utilization of coastal and marine resources, to be also used as inputs for Mediterranean strategies for sustainable development,

b) to identify, adapt, and test, in a realistic operational context, methodologies, tools and practices for sustainable coastal management in the region,

c) to contribute to the upgrading of relevant national/local institutional and human capacities, and

d) to secure a wider use, at national and regional levels, of experience and results achieved by the Programme and its individual projects, and create conditions for follow up.

The Programme provides to all MAP RACs and MEDPOL the opportunity of a harmonized joint practical work with the host country national and local authorities and institutions, demonstrating the capacity for integration and application of best methodologies, procedures and tools in real conditions, dealing with complex environment/development problems in coastal and marine areas and watersheds.

2. CAMP FUKA-MATROUH BACKGROUND INFORMATION

Initiation of the Programme

This programme was developed at the request of the Egyptian Government which expressed its commitment to the philosophy of the integrated planning and management of the coastal area of Fuka-Matrouh and invited the Co-ordinating Unit of the Mediterranean Action Plan to initiate the Programme. The Programme was implemented within the Mediterranean Action Plan - UNEP, in accordance with the conclusions of the Sixth and Seventh Ordinary Meetings of the Contracting Parties to the Barcelona Convention, and in close co-operation with the authorities of Egypt.

Preliminary activities relevant to the coastal area of Fuka-Matrouh started in the end of 1988. Three MAP/PAP missions visited Egypt in the period 1988-1992. Together with the Egyptian authorities and the Regional Activity Centres (RACs), they prepared the Coastal Area Management Programme (CAMP) for the Coastal Area of Fuka-Matrouh. In October 1992, the Egyptian Government and the Mediterranean Action Plan signed the "Agreement Relative to the Coastal Area Management Programme for the Coastal Area of Fuka-Matrouh (Egypt)". According to that Agreement MAP agreed to implement a number of activites, in cooperation with national and local authorities as well as expert teams from universities and other organizations, with the main goal to ensure sustainable development of the Fuka-Matrouh area.

Programme Study Area

One of the objectives of the Fuka-Matrouh Project was to support initiatives towards a national integrated coastal management policy. The proposed study area with its problems and concerns appeared to be enough representative of the wider Mediterranean coastal region of Egypt. The urgency of the problems related to tourism development trends in the time of the Project inception was another reason for the definition of the study area in its present boundaries.

The Fuka-Matrouh area is a semi-desert, sparsely populated area which is a part of the North-Western Mediterranean coast of Egypt, located approximately 210 km to the West of Alexandria. It is bounded on the North by the Mediterranean Sea, on the West by the escarpment of the plateau and on the South by an arbitrary line at approximateiy 100 m altitude.

The region encompasses almost 500 km of coastline and is characterized by arid Mediterranean climate, with an average rainfall along the coast of 100-180 mm per year. The region currently supports about 300,000 people whose primary source of income is derived from cattle production and fruit tree planting. The coastal zone had undergone degradation since the 11th century resulting from neglect and wars, nomadic life, cutting of trees and overgrazing. However, the zone was once highly productive, especially during Roman times who used dry land farming practices based on the development of water resources and storage of rain water in underground reservoirs.

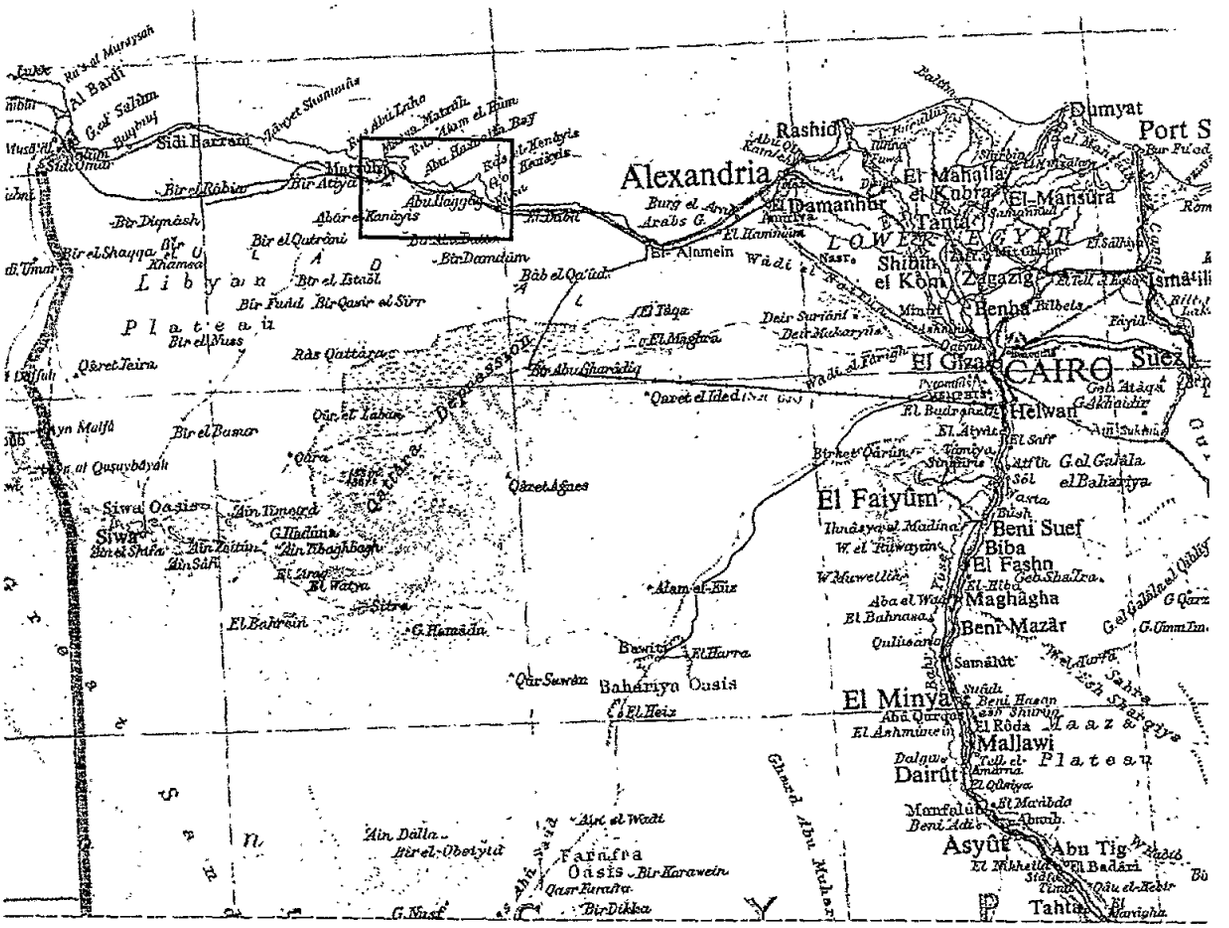


Figure 1: The Study Area

Another rather recent phenomenon is the business of building tourist villages along the coast. Majority of these villages are planned and designed as summer houses (secondary homes), intended chiefly to be sold on the domestic market. As such they are not used more than few weeks a year, and do not provide any significant number of new jobs for the local population or increase in tax base.

Taking into consideration its special characteristics, including the vicinity of the capital of Governorate, it was agreed that the area to be covered by the Project is approximately 100 km of coastal belt covering the area which starts from the City of Matrouh to the Fuka area in the East. As regards the depth of the area, it was agreed that it will cover an area ranging from 10 to 20 km from the coast.

Institutional Arrangement

The following main actors were participating in the development and implementation of the CAMP Fuka-Matrouh:

- Mediterranean Action Plan of UNEP,
- local authorities and institutions,
- national authorities and institutions,
- other international institutions and organizations.

MAP participated through:

- Co-ordinating Unit for MAP (Athens),
- Pollution Monitoring and Research Programme (MED POL),
- Priority Actions Programme Regional Activity Centre (PAP/RAC),
- Blue Plan Regional Activity Centre (BP/RAC),
- Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC),
- Specially Protected Areas Regional Activity Centre (SPA/RAC),
- Centre for 100 Historic Sites.

National co-ordinating authority was established at the Egyptian Environmental Affairs Agency with the objective to co-ordinate all relevant national institutions and authorities (financial, economic, planning, development, industry, energy, tourism, sanitation, transportation, water resources, etc.), receiving for this necessary scientific, technical, logistical and financial support as envisaged by the agreement and its budget and workplan.

Other international institutions and organisations participated in their respective fields of competence in accordance with the agreement between the national co-ordinating authority and the MAP Co-ordinating Unit.

National Coastal Management Programme

With the passing of the Law for the Environment (No 4/1994), and in recognition of the active development of the coastal zone and the increasing pressure and impacts on this zone from various sources, the Egyptian Environirnental Affairs Agency (EEAA) was given the responsibility to initiate and coordinate national ICZM activities. A National Committee for Integrated Coastal Zone Management was initiated, and the Secretariat of this Committee was established under the Environment Management Sector of the EEAA. One of the major tasks of the National Committee for ICZM is to develop a programme for the develnpment of a national ICZM Plan.

One of the key documents adopted by the National Committee is Framework ICZM Programme. This document analysed important characteristics and issues of the Egyptian coast and recognized the need for changing the existing trends of growth and development in coastal areas. In addition, it formulated objectives of the management strategy including institutional setting, and considered international, bilateral and national funding options. Finally, it elaborated candidate short term actions and projects.

Main coastal issues identified in the Framework ICZM Programme include:

- shoreline erosion and flooding,
- irrational land use and inappropriate land use planning system,
- water pollution from coastal and marine sources,
- deterioration of natural resources and habitats.

While the long-term objective of the Egyptian ICZM strategy is to develop and adopt national CZM Plan that provides a clear guidance for actions and activities in the coastal zone, the short-term objective is to identify the most vulnerable coastal areas and quickly develop a set of urgent measures that could be taken in order to bring irreversible environmental degradation to a halt. One of the pilot projects intended to improve coastal land use planning practice and to prevent adverse effects was suggested for coastal area east and west of the Matrouh city.

3. STUDY AREA PROFILE

The Fuka-Matrouh area is located in the central coastal part of the Matrouh Governorate which occupies the northwestern portion of Egypt. The Governorate is one of the largest in Egypt, with an area of 212,000 km^2, representing 22% of the area of the country. However, the population density in the Governorate is very low. According to the preliminary results of the 1996 census, the population of the Governorate amounts to 212,000 which gives a population density of around one person per km^2 (for comparison, population density in the Nile Valley and the Delta is about 1,500 inhabitants per km^2). Population density of the study area is around 10 inh/km^2. Population growth rate is around 3% while the national growth rate is 2.8%.

Marsa Matrouh city and its hinterland has the biggest concentration of population, around 90,000 inhabitants, representing about 40% of the total Governorate population, while the urban population of the Governorate amounts to 76%. There are two different social groups, the Bedouins as native population, and immigrants who have migrated from the Nile Valley. The Bedouins used to live nomadic life, but are now mostly settled in rural areas and in the desert, while the immigrants live in urban centres employed in Goverment services and construction.

As for the educational status of the population, the 1996 Census preliminary results show that about 2.3% of the population had a university degree, while those who received high school certificates accounted for 18%. Illiteracy rate was found to be around 33%, whereas the remaining 46.7% were classified in the "can read and write" category. It is worth noting that as education has received recently considerable attention from the government, the number of students attending schools has increased.

In general, pasturing was for a long time the main source of income in the Governorate, but with time, agriculture has become the principal source. Since the rain plays an important role in agriculture and pasturing and determines the yield, the level of income in both is characterized by uncertainty. This particularly affects the native population, the Bedouins, around 80% of whom are engaged in sheep and goat herding and cultivation of barley, vegetables and fruit trees. This fact justifies the trend to diversity the economic activities and, accordingly, the sources of income.

Concerning the Government policies in the study area, one of the main themes is to continue the development of the north coast of Egypt. This is to be carried out parallel to the development of other axes, such as the Red Sea, Sinai, and Southern parts of Egypt. The ultimate target is to increase the inhabited areas to 7-8% of the total area of Egypt. Accordingly, Five Years Economic and Social Plan, enviseges construction of the important water supply system components, including water pipelines and water stations.

Major problems and issues in the Fuka-Matrouh area can be summarised as follows:

- Uncontrolled development of tourism which mostly excludes local population as beneficiares while producing negative impacts on natural environment and infrastructure.
- Complex natural conditions that require sensible agricultural policies.

- Ecologically and environmentally sensitive areas, as well as valuable cultural heritage.
- Absence of an effective land-use planning and development control system, as well as of a participatory approach in overall development planning.
- Insufficient integration of policies (horizontal and vertical) among various bodies in charge of different sectors or geographic segments of the coastal area.

4. PROJECT OBJECTIVES AND CONTENTS

Objectives of the Project

The overall direction and goal of the Project is the future development of the area based on the principle of sustainability, achieved through integrated planning and management of coastal resources. Accordingly, the final project output, which is the integrated management plan, should incorporate all the knowledge gained by individual activities, and propose a concept of sustainable development of the Fuka-Matrouh area.

An important long-term objective of the Project was to create conditions for the establishment of the system of integrated planning and management of resources in the area, as well as to support efforts towards the development of a national coastal management programme. Following this objective the project team members were trying to move from strictly reactive actions as a response to emergency situations to comprehensive understanding of the coastal environment and social processes taking place there. This understanding is the prerequisite for the move from reactive, *ad hoc* measures to preventive actions which are always cheaper and safer than rectifying environmental harms later.

The immediate objective of the Project was to provide, within the individual actions, solutions to development and environmental problems of the most urgent nature which could be implemented in short run.

In addition to these objectives, each of the four Project components and 9 implemented activities had their own specific objectives harmonised with the Project needs and objectives.

Project Contents

During its life span, the Fuka-Matrouh Project ensured implementation of a number of activities belonging to the four main Project components, as follows:

1. Prospective analysis
   - systemic and prospective analysis, development/environment scenarios,
   - implications of climatic changes in the coastal area of Fuka-Matrouh.
2. Integrated planning and management programme
   - on-the-job training on the methodology of integrated planning and management in coastal areas,
   - integrated coastal management Planning Study for the coastal area of Fuka-Matrouh,
   - application of tools and techniques for coastal management:
     - Geographical Information System (GIS), application and training,
     - Carrying Capacity Assessment (CCA) for Tourism Activities.
     - Strategic Environmental Assessment (SEA),

3. Legal instruments and institutional structures
   - status and development of environmental legislation and institutional framework,
   - specially protected areas and implementation of the Specially Protected Areas (SPA) Protocol.
4. Sectoral planning (operational activities)
   - soil erosion, desertification, and water resources,
   - assessment of natural resources and soil conservation issues supported by remote sensing.

Detailed description of each activity, including the activity objectives, expected benefits, and institutional framework, were defined in the relevant Agreement.

5. PROJECT METHODOLOGIES, TOOLS AND PROCEDURES

Planning Process Methodology

The Fuka-Matrouh Project planning process followed a general methodology delineated in the beginning of the Project, which was adapted to the local conditions and developed during the project implementation. Apart from that, individual activities used specific methods of work, procedures and techniques that were suitable for the topics of those activities.

Generally speaking, the project was composed of two groups of activities: those primarily sectoral, focused on individual topics or issues which mostly make the analytical part of the planning process, and the activities which integrate the information and knowledge gained in the analytical phase in the form of outputs, such as ICAM Study, as the most important one, CCA and SEA.

The first phase of the planning process is characterised by scientific approach and relevant methods of analysis in depicting natural, physical and socio-economic conditions and processes. The second phase is characterised by public policy making approach which considers societal needs and goals, and relies on participatory process and administrative arrangements for policy adoption and implementation.

The first group produced as comprehensive, precise and value-free information as possible to support decision and policy making in the second stage of the planning process. The second phase of the planning process synthesised the collected information and produced an integrated physical development strategy at a regional level (ICAM Planning Study), and formulated a management strategy including legal and institutional aspects, as well as action plans and implementation guidelines. Theoretical basis of the first stage of the planning process was a rational planning model (problem identification, definition of opportunities and constraints, alternative strategies formulation), while the second stage was designed to rely mostly on the consensual (participatory) planning approach.

Although the project, by its physical scope, has a local character, when considering and evaluating development options of the study area significant inputs were required from the national and wider, regional levels. This regards especially the national policy of population decentralisation from the Nile Valley, which designated the Mediterranean coastal zone as one of immigration areas to which that population is directed. There is also a policy, less formal, of allocating tourist capacities for domestic population at the Mediterranean coast. The former is reasonable and can not be reproached, while the latter can not be easily avoided in the market economy conditions, so it has to be directed and managed appropriately.

Another aspect which required a wider consideration than defined by the borders of the study area regards administrative solutions and techniques related to the implementation of the ICAM Planning Study. The solution to this problem was facilitated by the preparation of the Framework ICZM Programme for Egypt (1996). It defined the basic institutional and legal arrangements, and the Fuka-Matrouh Project and the ICAM Planning Study fit into that

framework. The communication and co-ordination of activities between the Fuka-Matrouh project and the on-going national ICZM Programme were made easy by the fact that EEAA and its Environment Management Sector were in charge of co-ordinating both the overall national ICZM activities and the activities of the national team working on the Fuka-Matrouh Project.

Innovative Tools

With regard to the individual activities, some of them brought in innovative methodologies and tools that proved to be useful and applicable in the typical conditions of the Mediterranean coast of Egypt. Some of them are briefly presented in the following paragraphs.

In the activity "Assessment of Natural Resources and Soil Conservation Issues Supported by Remote Sensing" an integrated survey of land resources was carried out. The applied methodology combined high-tech remote sensing technologies with field survey and laboratory analysis which together enabled a cost effective way to provide comprehensive information on soil capabilities in a relatively large area. This information, in turn, proved to be a significant contribution to the land use planning process.

"Carrying Capacity Assessment (CCA) for Tourism Development" was an activity that applied the carrying capacity concept. While the concept is not new, its application in the Fuka-Matrouh Project was specific, trying to avoid mechanical calculations that pretend to deliver its outputs (usually a quota system to limit volume of visitors) with cold objectivity. Instead, in addition to physical factors, CCA in the Fuka-Matrouh Project tried to introduce socio-economic and cultural parameters to the analysis. Although these parameters are less prone to quantification, it turned out that they were crucial for the definition of the carrying capacity of tourism development in the study area.

Strategic Environmental Assessment (SEA) is another innovative tool applied in the Project. It enables environmental assessment for programmes, policies and plans. The need for this tool emerged after analysing the tourism development trends along the study area coastline. Although the present EIA provisions may be judged as rather comprehensive and capable to control future coastal projects (if effectively implemented and enforced), the need still exists for a tool that allows consideration of environmental impacts over larger geographic area and development time frame. This is exactly what SEA (i.e. of a regional land use plan) enables - assessment of cumulative, secondary, long-term or delayed impacts.

Although neither new nor original, mapping is an important part of the Fuka-Matrouh Project methodology. Geographic information and positional exactness is often important in depicting coastal phenomena. Accordingly, a significant aspect of the coastal profiling phase was the use of geographic information systems (GIS) as a principal tool of environmental information management. Traditionally, majority of disciplines communicate much easier in textual form, so the requirement to have "problems" drawn or marked down on the maps was a good exercise for all the team members. As a matter of fact, the national team from the University of Alexandria has undertaken important steps in establishing a strong environmental information department, and selected GIS and remote sensing as the principal technology for environmental information management. Building upon this, the Project ensured GIS support for most of the activities, and carried out GIS training and education programme for the national team members in Marsa Matrouh and Alexandria.

6. RESULTS OF INDIVIDUAL PROJECT ACTIVITIES

Systemic and Prospective Analysis

The Study elaborated interactive relationship between development and environment in a long-term, 30-50 years time horizon. Geographic reference was a wider area, the Matrouh Governorate and the Mediterranean coast of Egypt. Considering the future development paths the analysis took into account global and regional trends and impacts, and identified conflicting zones, sectors and key actors, as well as needed adjustments.

Implications of Climatic Changes

The objective of this activity was to assess the possible implications of expected climatic change on ecosystems, land-use and sea-use practices, and other human activities of the coastal area of Fuka-Matrouh, and to propose suitable management and policy response options. Due to rising sea level the eastern part of the coast would be subjected to coastal erosion processes including flooding of backshore areas and depressions, whereas slight impacts are expected at the western part of the coast owing to its topography. Change in the rainfall and increase in evapotranspiration may lead to a reduction in the cultivated areas, and agriculture is likely to change towards even more intensive farms. Temperature rise will cause higher energy demands (air conditioning) for new developments, in particular in tourism sector. The change in climate is not expected to have any significant impact on the evolution of population distribution and demographic trends in the area.

Soil erosion, Desertification and Water Resources

The main objective of this activity was to gain the necessary knowledge to prevent the degradation and loss of agricultural land. The basic study was performed in two pilot zones representative enough to enable transfer of results to the wider study area. The product of the activity is an information on soil agriculture potential (derived from a number of input data, such as slope, texture, depth, rainfall, salinity, sodicity and other chemical and physical properties). This information enables an optimization of the land use conflicts resolution process, such as agriculture and grazing, tourism development and agriculture, or protection and delineation of ecologically sensitive areas, i.e. salt marshes.

Assessment of Natural Resources and Soil Conservation Issues Supported by Remote Sensing

This study provided an integrated survey of land resources of the study area. The applied methodology included the use and interpretation of satellite images, field survey, laboratory analysis and additional processing, as well as corrective image interpretation. The final product of the activity is the land system map composed of 3 Geographical Regions, 12 Land Systems and 25 Landscapes. The whole activity proved to be a cost-effective way of obtaining synthesized information on land resources of the Fuka-Matrouh area, and their suitability for different potential uses. Such an application brings more rationality into the

land use planning process. In addition, one of the services provided by this activity refers to the dissemination of knowledge and expertise to local experts who were directly participating in the main stages of the project.

Specially Protected Areas – Marine/Terrestrial Ecosystems and Cultural Heritage

The first task of this activity was the identification of the main terrestrial and marine ecosystems, and determination of the level of their ecological sensitivity. Among the sensitive marine ecosystems, Rass ElHekma, Abu Hashafa and bay with the Matrouh lagoon are the most important ones. On the terrestrial side, seven habitats were identified with information on status, distribution and ecology including the need for further research because of the lack of baseline information. Management measures have been proposed with regard to grazing control, as well as propagation of multipurpose and native species. A detailed survey of the wider area on the marine turtles nesting occurrence (Gulf of Hekma, Abu Hashafa Bay) was performed.

With regard to cultural heritage a wider area was examined (East, West and South of Matrouh) where the major sites were analysed (Abu Seir, Marina/El Alamein, Cleopatra Bath, Agiba Site, sites in the Oasis of Siwa). Finally, the management measures were proposed including the definition of the site zoning, with a core area, exclusion zone, buffer zone, and approaches and service area. In addition, other management measures were discussed, such as potential revenue generating facilities.

Geographical Information Systems (GIS)

From the very beginning of the Project the need was identified for efficient environmental information management, and Geographic Information Systems (GIS) was found to be the appropriate tool for that purpose. The main product of the activity is a geographic database developed for the study area which covers main natural, physical and socio-economic features of the area. The main application developed within this activity was land suitability analysis the results of which were used as important inputs for land classification schemes prepared as a part of the integrated coastal management Planning Study. In addition, the services provided by this activity include training and education of local teams. Training enabled the team members to carry out specific tasks based on accepted methodology and brought them to a desired level of efficiency. The objectives of education were to bring the team members to an understanding of the subject so that they can form independent opinions, and understand and discuss the methodology.

Carrying Capacity Assessment (CCA) for Tourism Development

The existing tourism development patterns of the Fuka-Matrouh coastal area (dominated by secondary residence resorts for domestic population) tend to produce tourist saturation of the area in a relatively short period.

Three possible scenarios of future tourism development were considered:

- continuation of the existing trend of almost uncontrolled development with short-term benefits and extensive use of resources,
- an enclave concept of tourism development - tourism oasis for foreigners with low contribution to local economic development,
- balanced, sustainable tourism development.

The sustainable option is based on the tourism product designed to attract domestic as well as international market and, as a result, to extend tourist season (this seems to have been recognized recently when the TDA put the requirement for each developer to follow 1 to 1 ratio between summer house resort beds and hotel beds; this measure was necessary to curb the practice of building almost solely tourist villages which do not provide any new long-term jobs or income for the local population, and from the economic point of view may be considered as poor investments). Carrying capacity related to this option was further elaborated using three main categories of parameters: a. the physical - ecological parameters, b. the socio-cultural parameters, c. the political - economic parameters.

Finally, the estimated maximum accommodation capacity of the entire area is between 80,000 and 100,000 beds. Having in mind the existing accommodation capacities together with the so-called "tourist resorts", the future commercial tourism development can count on around 40,000 to 50,000 additional beds. This, together with other relevant information, was an important input for planners in the preparation of the integrated coastal management Planning Study for the coastal area of Fuka-Matrouh

Integrated Coastal Management Planning Study for the Coastal Area of Fuka-Matrouh

Integrated Coastal Area Management Planning Study synthesized all the knowledge and recommendations gained by individual activities and sectoral studies. The study identified the main development issues, and the stakeholders that need to participate in the planning process. The topics that were studied include population, resources, employment, industry, transportation, social services, conservation and landscape. While all these topics had to be looked at in order to anticipate future demands for land, the Study suggested that the capacity of the local authority planners to influence development pattern had been limited since they were under control of other, higher-level Government departments, and the private sector interests.

The Study analyzed the overall development opportunities as well as constraints and threats, and formulated few scenarios of the Fuka-Matrouh area future. In addition, using the outputs from preceding activities, particularly Carrying Capacity Assessment (CCA) for Tourism Development, the Study formulated the overall structure or framework of a future development till the year 2020 by means of written statements, illustrated by diagrammatic plans.

Year	Total population	Planning zone 1		Planning zone 2				
		Subzone 1	Subzone 2	Subzone 3	Subzone 4	Subzone 5	Subzone 6	Subzone 7
2000	110,000	90,000	?	?	?	?	?	?
2010	200,000	120,000	8,000	14,000	12,000	16,000	10,000	20,000
2020	380,000	180,000	20,000	35,000	30,000	45,000	25,000	45,000

1–Marsa Matrouh, 2–Alam El Ram, 3-Garawla, 4-Hawala, 5-Baggush, 6-Hekma, 7-Fuka

Table 1: Population Distribution in the Study Area till Year 2020 according to the ICAM Planning Study Population Growth Projection (Maximal Capacities)

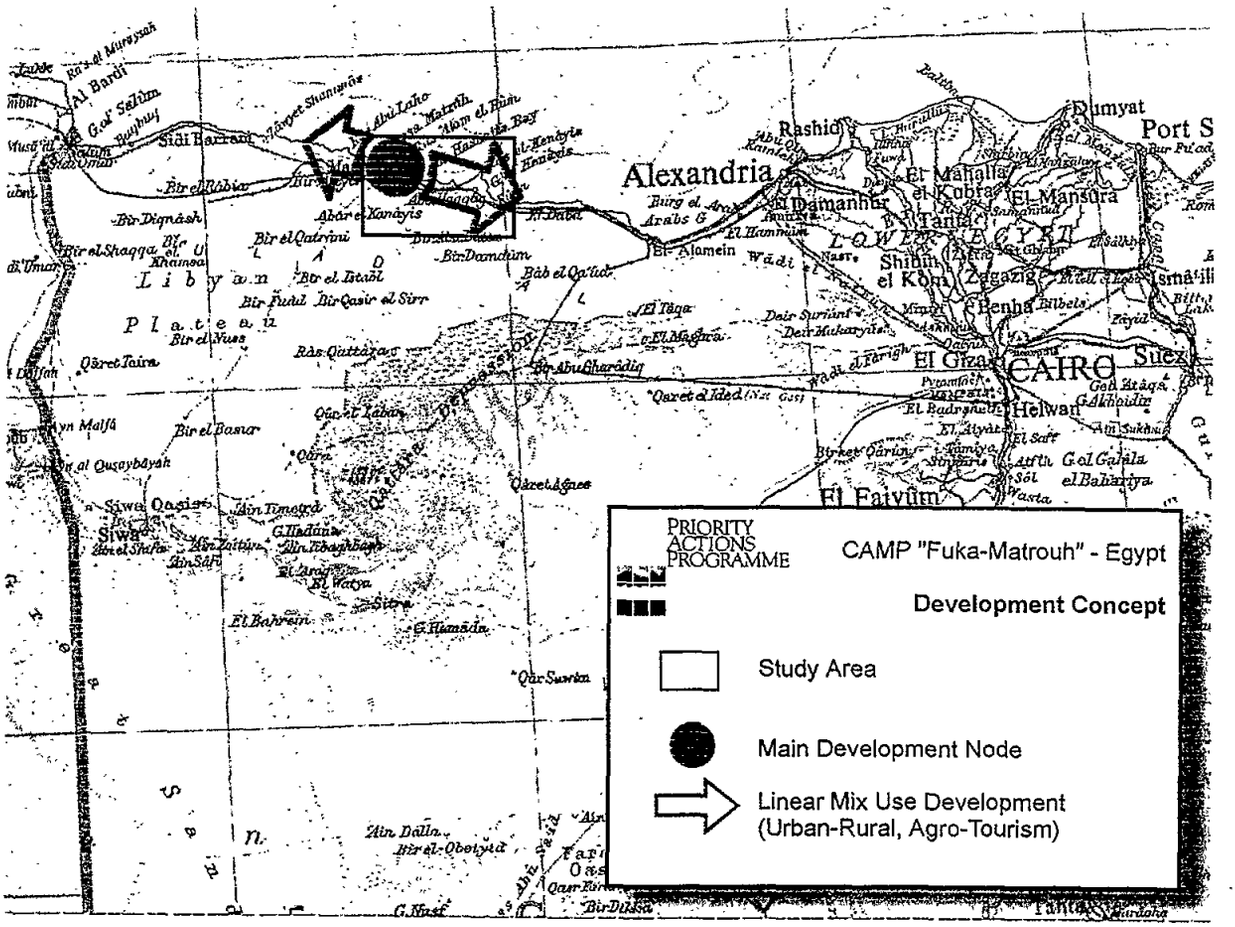


Figure 2: Development Concept

Year	Number of beds	Planning zone 1		Planning zone 2				
		Subzone 1	Subzone 2	Subzone 3	Subzone 4	Subzone 5	Subzone 6	Subzone 7
2000	40,000	?	?	?	?	?	?	?
2010	66,000	14,000	8,000	6,000	8,000	14,000	6,000	10,000
2020	100,000	20,000	15,000	8,000	12,000	20,000	10,000	15,000

1–Marsa Matrouh, 2–Alam El Ram, 3-Garawla, 4-Hawala, 5-Baggush, 6-Hekma, 7-Fuka

Table 2: Distribution of Tourist Accomodation Capacities in the Study Area till Year 2020 According to the Carrying Capacity Assessment for Tourism Development (Maximal Capacities)

The development concept proposed in the Fuka-Matrouh Project and shown within the study area boundaries is the result of the considerations not only of the resources and processes within the study area but also of the whole Mediterranean coast of Egypt, its development potentials as well as present development trends. This concept envisages the creation of an important development pole in the western coastal region. Instead of individual tourist resort projects sneaking into the coast and silently using it up, mostly excluding the local population as beneficiaries, the proposed concept aims at a comprehensive development of the western coastal region. This regional development concept has the following objectives:

- to support the national population decentralization policies attracting people from the overpopulated Nile valley,
- to support the idea of the North African coastal transportation and development corridor,
- to enable spatial dispersal of international tourist development which will provide reduced pressure on the sensitive coastal environments while ensuring more equitable distribution of benefits nation-wide,
- to introduce measures and technologies to develop most of the land suitable for agriculture (including the restoration of rangeland) to revitalize rural, mostly Bedouin communities, and take advantage of their intimate knowledge of this environment,
- to ensure diversification of the tourist product and activities (larger share of commercial and international tourism) providing for more jobs in tourism as well as in other tourism related sectors,
- to ensure protection of the area's natural and cultural heritage,
- to promote mixed-use, linear concept of peri-urban villages east and west of the Matrouh city, with tourism installations closer to the waterfront, residential or rural areas behind, and agriculture and light industry facilities (i.e. agroprocesing and handicrafts production) closer to the main transportation corridors.

Coastal system division	Coast-line (km)	Coastal area (km^2)	Tourist capacity (beds)	Local population	Total population	Degree of control	Main activities/uses
Critical zone (seafront 0.2 km)	170	20	-	-	-	Absolute	Beach activities
Dynamic zone (3.0 km)	-	300	100,000	100,000	200,000	High	Mixed – tourism, residential, public, buffer zones
Independent zone (the rest within the study area)	-	2280		280,000	280,000	Standard	Mixed – agriculture, residential, light industry, rural
Total	**170**	**2600**	**100,000**	**380,000**	**480,000**		

Table 3: Distribution of Population and Main Land-Uses according to the Linear Mixed-Use Development Concept

This kind of Planning Study should be the basis for stakeholder participation and for further examination in public before the final document of this type is formally adopted. Once approved, this kind of document should serve as a basis for the preparation of local land use plans and site plans, as well as subject plans such as tourism development master plan. One of the tasks of the National Committee for ICZM is to ensure statutory powers of regional and sub-regional coastal management plans (ICAM Planning Study with its planning scale and degree of detail represents the regional planning level, but in reduced geographic coverage), preferably through a national level document such as ICZM Plan or national coastal management guiding statements.

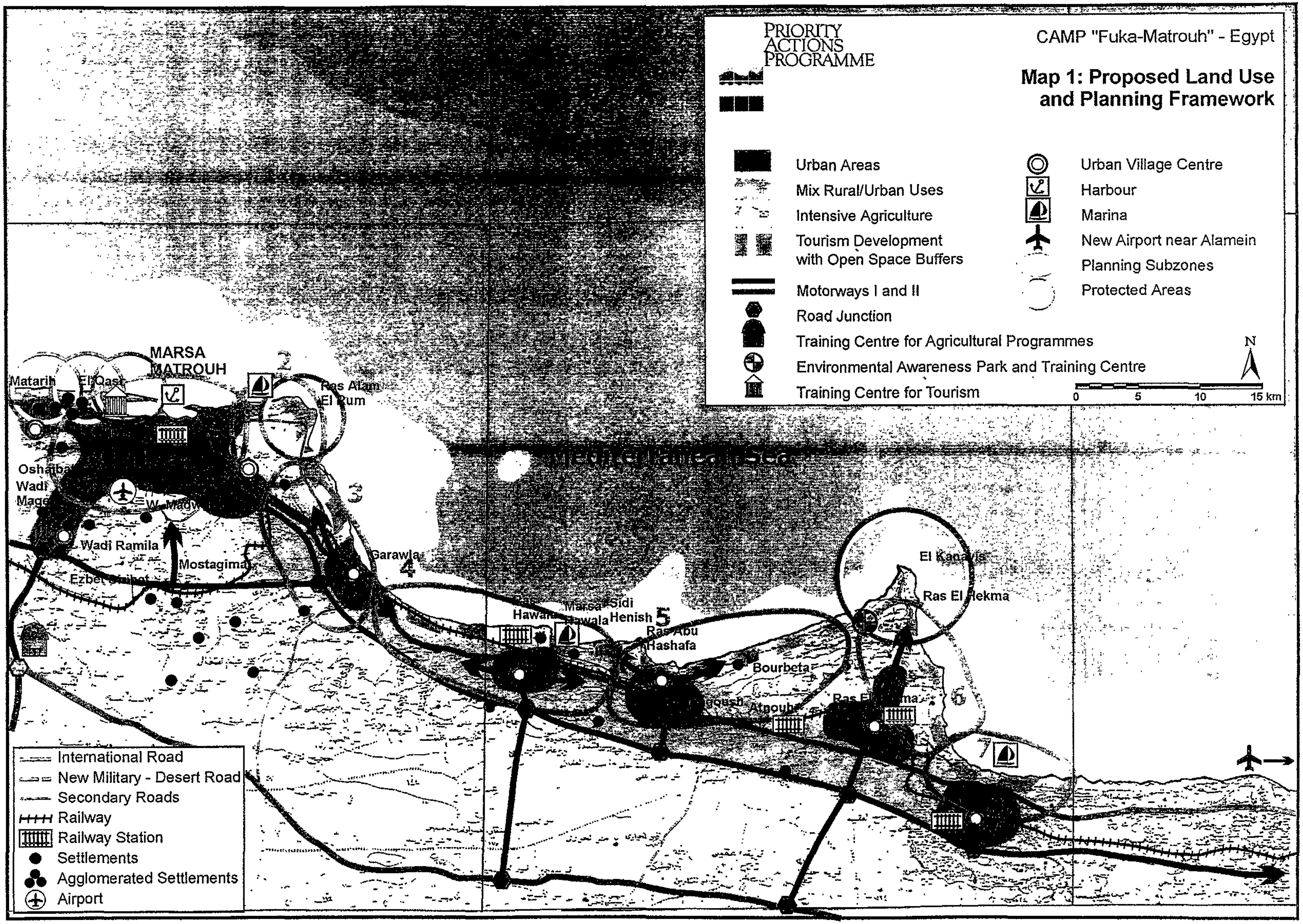
Although the ICAM Planning Study was an expected and needed output, equal attention during the joint work had been paid to the planning process itself. To this end, international consultants often applied an approach where contents emerged from the guided process. This methodology required all the team members to share responsibility for what they do, while consultants took the role of process facilitators. This approach encouraged the team members to take ownership of the activity outcomes.

Strategic Environmental Assessment (SEA) of the ICAM Planning Study

An important aspect in case of the coastal development of the Fuka-Matrouh area is a need to ensure tools to assess not only the individual projects within the usually very limited geographic area, but also whole development programmes or plans covering wider coastal segments (i.e. additive impacts of tourist villages in the whole Fuka-Matrouh coastal strip). For this purpose a Strategic Environmental Assessment of the ICAM Planning Study was chosen as an appropriate tool to deal with this issue. This will at least provide an opportunity for responsible authorities to anticipate cumulative impacts of a number of similar projects which, if considered individually, may not impose danger to the environment, but assessed as a whole may show quite a different picture.

The matrix method was used in predicting the magnitude and significance of various activities contained in the ICAM on the natural and man-made environment. The considered human activities are classified into six classes: transportation, urbanisation and services, industrialisation activities, agriculture and related activities, tourism activities, and complementary activities. The proposed development of the area includes the development of five new tourist coastal sub-zones, which together with greater Marsa Matrouh area will attract approximately 100,000 tourists. The local population is planned to increase to 380,000, making the total population of 480,000. The population increase is accompanied by the development of appropriate infrastructure, such as road network, utilities network and various services. Such tremendous population increase would generate a high volume of waste, both solid and liquid. Construction of residential and tourist houses, as well as infrastructure objects will affect the soil and existing water courses. In order to avoid severe degradation of the, so far, virgin environment due to waste generation, appropriate infrastructure should be developed before the development of sub-zones and the planned residential, tourist and industrial capacities. Since the area is lacking in fresh water it would be reasonable to consider the water reuse rather than its discharge into the sea after appropriate treatment. Before any decision on development, as a general rule, an Environmental Impact Assessment for each project should be implemented.

The proposed development of the area may create severe conflicts with the local population (Bedouins), with their culture, life style and traditional activities. To avoid the conflicts negotiations with tribe representatives at an early stage of project preparation would be mandatory.



PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 1: Proposed Land Use and Planning Framework
Urban Areas
Mix Rural/Urban Uses
Intensive Agriculture
Tourism Development with Open Space Buffers
Motorways I and II
Road Junction
Training Centre for Agricultural Programmes
Environmental Awareness Park and Training Centre
Training Centre for Tourism
Urban Village Centre
Harbour
Marina
New Airport near Alamein
Planning Subzones
Protected Areas
N
0
5
10
15 km
MARSA MATROUH
Ras Alam El Rum
Garawla
Mostagima
Wadi Ramila
Oshaiba
El Qasr
Hawala
Marsa Hawala
Sidi Henish
Ras Abu Hashafa
Bourbeta
Atnouba
El Kanayis
Ras El Hekma
1
2
3
4
5
6
7
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport

7. INTEGRATION OF FUKA-MATROUH PROJECT INTO THE NATIONAL COASTAL MANAGEMENT PROCESS

The EEAA was given specifically the authority to "... participate with the concerned agencies and ministries in the preparation of the National Integrated Coastal Zone Management Plan for the Mediterranean Sea and the Red Sea" (Law for the Environment, No 4/1994). The ICZM activities in Egypt are initiated, co-ordinated and supervised by the Government (EEAA) and can therefore be regarded as a top-down approach. The institutional structure for implementation, in addition to the National Committee for ICZM, includes regional (Mediterranean Coast Department) and sub-regional levels (Alexandria branch office).

Although the national ICZM Plan should be the umbrella document that guides the overall coastal development, the coastal management process requires preparation of a number of other plans (strategic or operational plans / integrated (comprehensive, multi-sectoral), or subject (sectoral) plans at national, regional and local levels). Obviously there is a need to avoid confusion and the justified fear of a bureaucratic interpretation which might require the preparation of too many expensive and unnecessary planning documents.

The solution to the competing pressures for site specific, operational plans (as opposed to higher-level strategic or integrated plans) is to develop a structured coastal management programme identifying management priorities at the national, regional and local levels.

In a situation where an issue is well defined, management actions are simple and unlikely to cause conflicts between different user-groups, the first approach is to undertake immediate management actions or to prepare a subject (or sector) plan. Still, it is important to avoid the recent practice in the Fuka-Matrouh area which shows the danger of embarking on a large number of detailed site plans while the overall context and impact of those plans are lost.

The Fuka-Matrouh area is, to the contrary, a good example of the area where an integrated coastal management plan is needed because of negative development trends, conflicting issues/users and complex management problems. The wider Matrouh area (including the Fuka-Matrouh Project area), besides the need to be covered by a regional-level integrated plan, requires the preparation of a sub-regional plan, particularly if the intensive development concept, as proposed by this Project, is to be accepted.

The typical planning scale at the regional level is 1:100,000, and at the sub-regional level 1:25,000. Within this planning framework, the ICAM Planning Study for the Fuka-Matrouh area covers a geographically small but very important segment of the future regional level ICZM plan. Although the Project geographical extent is small, the development concept proposed in the Fuka-Matrouh Project is the result of considerations of much wider planning levels.

Regional plan is often the most difficult scale of coastal plan to develop. It bridges the gap between tangible local issues and strategic national guidance. Regional plan is also the first planning level which is sufficiently detailed to become spatially oriented. In addition, regional level ICZM planning process is very complex in terms of horizontal integration of sectoral

competent authorities, usually line ministries which will implement relevant policies. Participation in the planning process of all levels of government, including local stakeholders (governorate level), is another essential component of the planning process.

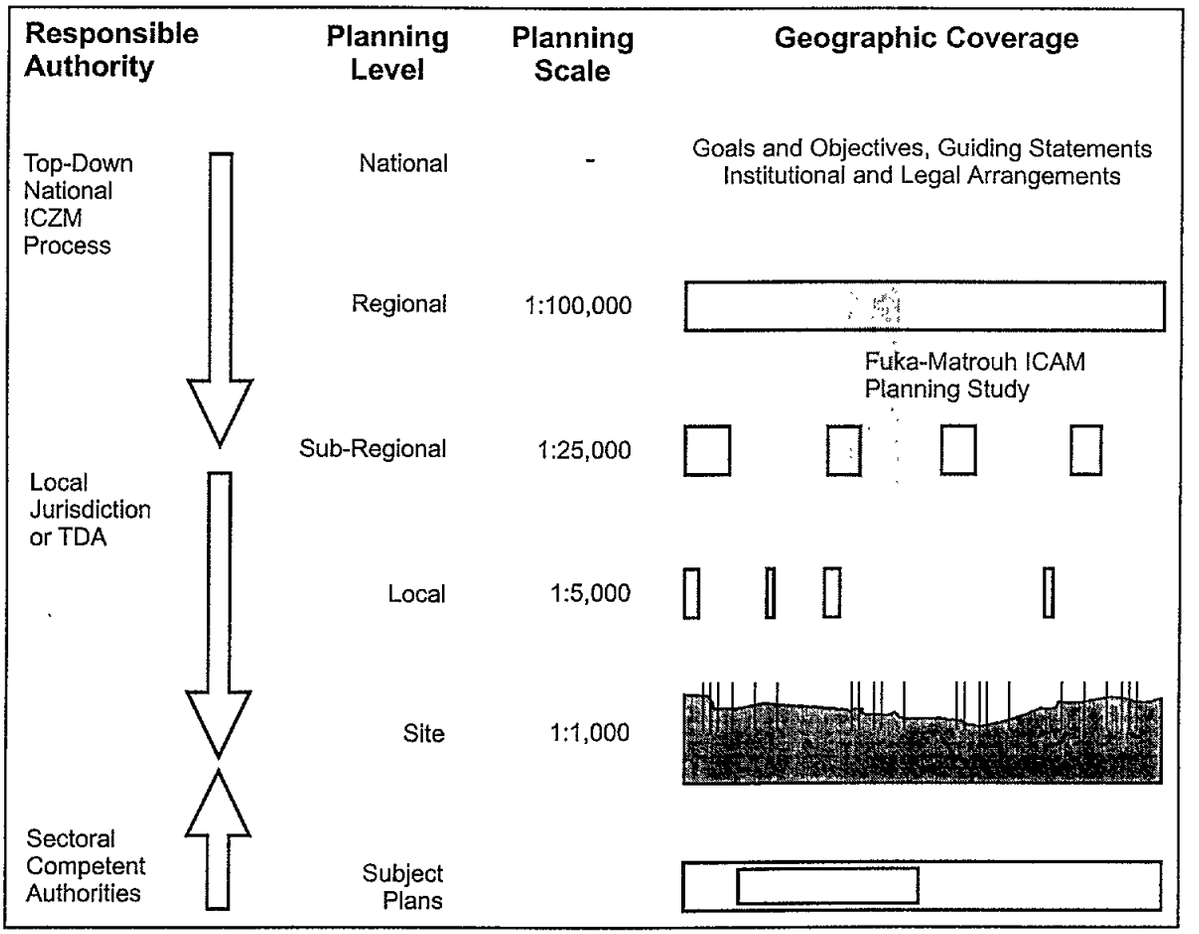


Figure 3: Coastal Planning Framework

This, so called vertical integration among administrative levels is even more important at the implementation stage.

All the integration issues mentioned when describing the regional level planning are typical of the whole coastal management process, and show the need for real power of the entities in charge of providing integration. The great majority of governments, including Egyptian, are established along sectoral divisions, delivering services through different government agencies. Taking this as a reality, actual day-to-day management of coastal resources in Egypt will, for most part, remain sectoral in the foreseeable future. What is to be integrated (co-ordinated, harmonised) is the planning and policy making process. To this end, power of the existing line agencies should be balanced with the real operational powers of co-ordinating bodies such as the National Committee for ICZM.

While the Fuka-Matrouh project has provided a comprehensive scientific and technical analysis, and proposed a sound and ambitious development concept, there are, as just mentioned, numerous administrative and socio-political issues that should be resolved if the coastal management goals are to be achieved.

8. PROPOSAL FOR FOLLOW-UP – ACTION PLANS

A. Urgent and Short-term Actions (Study Area and Governorate Level)

A.1. Guidelines for Regional Planning

A.1.1. Establishment of a Governorate Coastal Planning Commission

- representatives of scientific community, local authorities, business sector, NGOs, as well as other existing institutions dealing with development planning and environmental protection at the Governorate level
- promotion of the ambitious and knowledge based regional development concept
- co-ordination with the National Committee for ICZM, national planning institutions, EEAA, TDA, Coastal Protection Authority and other competent administrative authorities,
- initiation and co-ordination of the short, medium and long term actions

A.1.2. Preliminary designation of specially protected areas

- covers natural and cultural heritage and hazard-prone coastal areas
- subject plan with emphasised spatial reference (exclusion and buffer zones)
- based on existing information and expert opinions
- application of precautionary principle
- areas under pressure for tourism development to be elaborated first

A.1.3. Preliminary designation of the land suitable for agriculture

- application of soil capability analysis and land suitability analysis (methodology developed in the Fuka-Matrouh Project)
- application of land upgrading techniques (landscaping, water provision and feeder roads – methodology developed in the Qasr Rural Development Project)
- based on existing information and expert opinions

A.1.4. Control of the tourism development projects

- temporary moratoria on the tourist resort projects that endanger coastal resources or do not create adequate jobs and income for local population
- strict enforcement of the existing Environmental Guidelines for Development in the Coastal Areas until A.2. is completed

- strict enforcement of the requirement for each tourist establishment developer to follow 1 to 1 ratio between tourist village beds and hotel beds
- assessment of tourism development projects within the framework of SEA

A.2. Preparation of the General Structure Plan of the Governorate Coastal Area

- Considerations of national policies (population redistribution, tourism development)
- Local population projections
- Tourism development carrying capacity
- Land classification schemes (main land uses according to land suitability analysis)
- Infrastructure development

B. Medium and long term actions (Mediterranean coastal region of Egypt)

B.1. Preparation of the ICZM Plan for the Mediterranean coastal area

- Policy oriented research of critical issues
- Protected areas (natural and cultural)
- Protection against coastal hazards and effects of climatic changes
- Coastal land use planning (including Strategic Environmental Assessment)

B.2. ICZM Plan Implementation Process

- Institutional arrangements for implementation
- Human capacity building (on regional and local levels)
- Preparation of the regional, sub-regional and local land use plans
- Legal provision for Strategic Environmental Assessment (for ICZM Plan and regional plans while for local land use plans if appropriate)
- Environmental information management (including GIS and RS)
- Monitoring and evaluation (feedback process)
- Environmental education and participation programmes

B.3. Sectoral Projects

- Renewable energy project
- Coastal Environmental Information System based on GIS and RS technologies
- Low cost wastewater treatment technologies
- Regional oil spill response programme
- Food processing and agromarketing centre
- Handicraft centre

Annex I: List of Project Documents

1. Eid, El Mohamady; Misak, Raafat: Report on the Existing Documents of the Fuka and Siwa Areas - Egypt, Cairo, August 1990 (PAP/RAC)
2. Eid, El Mohamady: Integrated Planning and Management of Fouka Area (Egypt), Cairo, 1990 (PAP/RAC)
3. Draft CAMP Project for Fuka-Matrouh Area (Egypt), Athens, 1992 (MAP)
4. Agreement Relative to the Coastal Area Management Programme for the Coastal Area of Fuka Matrouh (Egypt), Athens, October 1992 (MAP)
5. Marine and Coastal Environment - Questionnaire, Split, March 1993 (PAP/RAC)
6. Ferrari, Giovanni: Proposal for the Study of Soil Erosion and Desertification in the Management Programme for the Coastal Area of Fuka-Matrouh (Egypt), Florence, April 1993 (PAP/RAC)
7. Beltagy, Ali Ibrahim: The Marine Ecosystems of Fuka-Matrouh Area (Egypt) - Status of Species and Habitats, Tunis, 1993 (SPA/RAC)
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9. Ayyad, Mohamed Abdel-Gawad: The Terrestrial Ecosystems of Fuka-Matrouh Area (Egypt): Status - Protection and Management Measures, Tunis, 1993 (SPA/RAC)
10. Dragicevic, Miroslav; Sürücü, Feyza: Report of the Mission Concerning the Tourism Carrying Capacity of the Fuka-Matrouh Area, Split, September 1993 (PAP/RAC)
11. Fawzi, Mohamed *et al.*: Up-Dated On-Site Report for the Fuka-Matrouh Area, Egypt, Cairo, November 1993 (PAP/RAC)
12. Report of the Workshop on Geographical Informatioin Systems in Integrated Coastal Area Management (Alexandria, November 13-18, 1993), Split, November 1993 (PAP/RAC)
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17. Ayyad Mohamed,: A Framework for Accumulating Consequential Data and Knowledge, May 1995 (BP/RAC)

18. Abdel-Kader, Fawzi H., *et al.*: Soil Degradation and Desertification - Second Quarterly Progress Report (April-June 1995), Alexandria, June 1995 (PAP/RAC)

19. Land Based Sources of Pollution in Matrouh-Fuka Area, National Institute of Oceanography and Fisheries, Alexandria, 1995 (MEDPOL)

20. Assessment of Land Resources Supported by Remote Sensing, Palermo, September 1995 (RAC/ERS)

21. El-Raey, Mohamed, *et al.*: Invetory GIS Database and Suitability Analysis of Fuka-Matrouh Area (Egypt), Alexandria, December 1997 (PAP/RAC)

22. El-Raey, Mohamed, *et al.*: A Framework for Integrated Coastal Area Management Plan Fuka-Matrouh (Egypt), Alexandria, June 1998 (PAP/RAC)

23. El-Raey, Mohamed, Fawzy Mohamed, et al.: Strategic Environmental Assessment of the Integrated Coastal Area Management Plan of the Fuka-Matrouh Area (Egypt), Alexandria, December 1998 (PAP/RAC)

24. Klarić, Zoran, Komilis Panajotis,: Carrying Capacity Assessment for Tourism Development in Fuka-Matrouh Area, March 1999 (PAP/RAC)

25. Parpairis, Apostolos,: Integrated Coastal Area Management Planning Study for Fuka-Matrouh Area, April 1999 (PAP/RAC)

ANNEX II

STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE INTEGRATED COASTAL AREA MANAGEMENT PLAN OF FUKA-MATROUH AREA, EGYPT

UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN

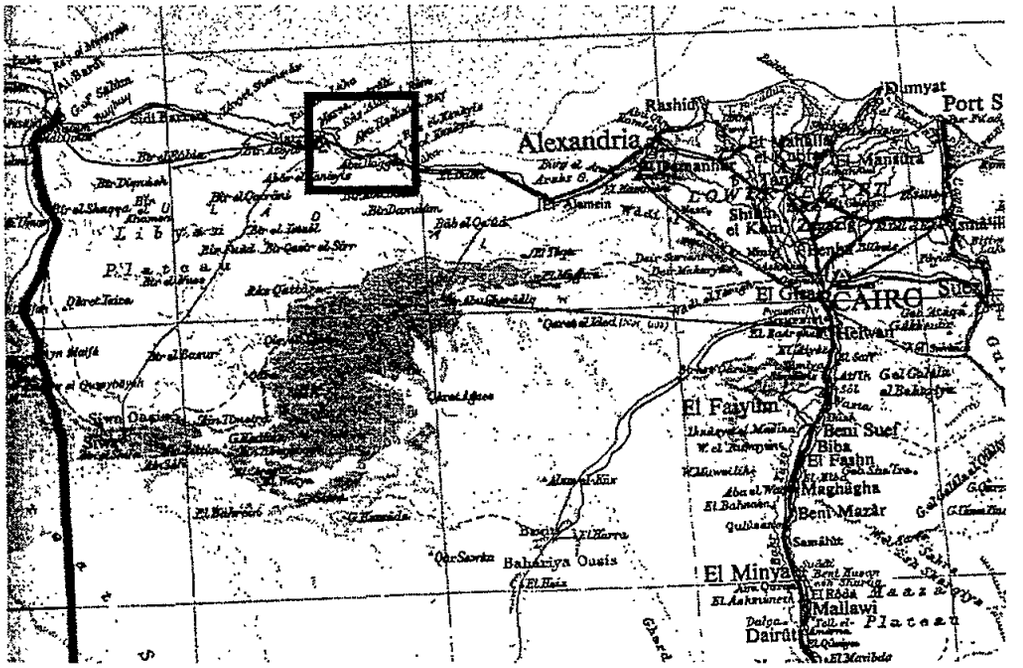
UNEP

MAP

PRIORITY
ACTIONS
PROGRAMME

Coastal Area Management Programme (CAMP)
FUKA-MATROUH - Egypt

Report of the Final Presentation Conference for the CAMP "Fuka-Matrouh" (Cairo, June 8-9, 1999)



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Priority Actions Programme
Regional Activity Centre
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Report
of the Final Presentation Conference
for the CAMP "Fuka-Matrouh"
(Cairo, June 8-9, 1999)

Background Information

1. The Coastal Area Management Programme (CAMP) is the MAP programme for sustainable coastal management, integrating environmental concerns into development planning and practice, oriented at understanding and resolving practical environmental, development and management problems at local and national levels in Mediterranean coastal areas. The geographic context of the Programme is defined by the Barcelona Convention, and encompasses the Mediterranean marine environment and its coastal and watershed areas. The Programme started in 1989, on the basis of a decision by the Contracting Parties to the Barcelona Convention adopted at the Athens meeting.

The objectives of the Programme are:

a) to develop strategies and procedures at local and national levels for a sustainable development, environment protection and rational utilisation of coastal and marine resources, to be also used as inputs for Mediterranean strategies for sustainable development,

b) to identify, adapt, and test, in a realistic operational context, methodologies, tools and practices for sustainable coastal management in the region,

c) to contribute to the upgrading of relevant national/local institutional and human capacities, and

d) to secure a wider use, at national and regional levels, of experience and results achieved by the Programme and its individual projects, and create conditions for follow up.

The Programme provides to all MAP RACs and MEDPOL the opportunity of a harmonised joint practical work with the host-country national and local authorities and institutions, demonstrating the capacity for integration and application of best methodologies, procedures and tools in real conditions, dealing with complex environment/development problems in coastal and marine areas and watersheds. So far, 6 CAMP projects have been completed, 2 are in implementation, and 5 new ones are in preparation.

2. The CAMP "Fuka-Matrouh" was developed at the request of the Egyptian Government which expressed its commitment to the philosophy of the integrated planning and management of the coastal area of Fuka-Matrouh and invited the Co-ordinating Unit of the Mediterranean Action Plan to initiate the Project. Preliminary activities relevant to the coastal area of Fuka-Matrouh started in the end of 1988. Several MAP/PAP missions visited Egypt in the period 1988 - 1992. Together with the Egyptian authorities and the Regional Activity Centres (RACs), they prepared a proposal for the Coastal Area Management Programme (CAMP) for the Coastal Area of Fuka-Matrouh. In October 1992, the Egyptian Government and the Mediterranean Action Plan signed the "Agreement Relative to the Coastal Area Management Programme for

the Coastal Area of Fuka-Matrouh (Egypt)". According to that Agreement MAP agreed to implement a number of activities, in co-operation with national and local authorities, as well as expert teams from universities and other organisations, with the main goal of ensuring sustainable development of the Fuka-Matrouh area.

3. The first Project presentation conference took place in Marsa Matrouh in September 1995. By that time most of the sectoral project activities had been completed, and some others were launched. The results achieved and outputs produced at the time were presented, and directives for future work were elaborated. Accordingly, in the period of 1996-98 the rest of the Project activities were completed, and in the beginning of the year 1999 the decision was taken to organise the Final Presentation Conference. The main purpose of the Conference was to present the outputs and final results of the Project to the Egyptian authorities at the national, regional and local levels, as well as to discuss the lessons learned and to formulate recommendations for follow-up activities.

4. The Final Presentation Conference was organised on June 8-9, 1999 at the "Marriott" Hotel in Cairo. It was attended by 45 representatives of Egyptian authorities and institutions, MAP, and other national and international institutions and organisations. A complete list of participants is attached as Annex I, while the agenda of the Conference is contained in the Annex II. The list of documents presented in the Conference is given as Annex III.

5. Mr. I. Abdel Gelil, Chief Executive Officer of EEAA, welcomed the participants on behalf of Egyptian authorities. He stressed in his opening statement that this conference marked an important milestone in the coastal area management programme. He acknowledged the high level of expertise and dedicated efforts of the Fuka-Matrouh project team throughout the project implementation, and pointed out the commitment to implement the Law on the Environment. He singled out partnerships and stakeholder involvement as important policy tools at the national level, including ministries, governorates, the private sector, local communities and NGOs. He particularly pointed out the replicability of the Fuka-Matrouh methodology in other equally sensitive areas as one of the main features of the project. The complete text of Mr. Abdel Gelil's speech is presented in the Annex IV.

6. Mr. L. Chabason, Co-ordinator of MAP, greeted the participants on behalf of Mr. K. Toepfer, Executive Director of UNEP. He expressed gratitude to H.E. Ms. N.M. Ebeid, Minister of State for the Environment, Mr. I. Abdel Gelil, Chief Executive Officer of EEAA, and Mr. A. Abu Azm, Head of Environmental Management Section of EEAA, for their continued support to the Fuka-Matrouh project implementation. He also thanked H.E. Mr. K. Amer, Governor of Matrouh, and Mr. M. El-Raey, Dean of the Institute for Graduate Studies and Research (IGSR) of the University of Alexandria, as well as the members of the national and local teams for their involvement in the project implementation, and Mr. D. Štambuk, Ambassador of Croatia. Mr. Chabason gave a brief information on MAP activities emphasising the importance of CAMP and specifying its objectives including support to national ICAM initiatives and capacity building. He also briefly mentioned the individual project activities and the overall methodology, particularly emphasising the recognition and designation of environmentally sensitive areas. Among the individual activities he paid particular attention to the ICAM Planning

Study and the intensive development concept proposed, and pointed out the need for an appropriate administrative system to support the implementation of such complex projects. The complete text of Mr. Chabason's statement is presented in the Annex V.

7. Mr. L. Chabason proposed the Officers of the Conference. His proposal was accepted and Mr. M. El-Raey acted as Chairman of the Conference, and Mr. G. Berlengi as Rapporteur.

8. Mr. M. El-Raey, University of Alexandria, presented a general overview of the CAMP "Fuka-Matrouh". He emphasised the common Mediterranean heritage as a basis for co-operation. He informed on the principal groups of activities and their inputs, stressing particularly the integrative activities, such as GIS data base development, CCA, ICAM Planing Study, and SEA. He expressed his expectation that the Conference would come out with some follow-up proposals for the activities that showed great potential and applicability. Copies of the transparencies that accompanied the presentation are enclosed in Annex VII.

9. Mr. I. Trumbić, Director of PAP/RAC, presented the Final Integrated Report of the CAMP "Fuka-Matrouh" project. He went more in detail in describing the project objectives, activities and their results. First he described the project study area and its representativeness with regard to its main development issues which include:

- Uncontrolled development of tourism;
- Complex natural conditions requiring sensible agricultural policies;
- Ecologically and environmentally sensitive areas, as well as valuable cultural heritage;
- Absence of an effective land-use planning and development control system;
- Insufficient integration of policies among various bodies in charge of different sectors or geographic segments of the coastal area.

He than explained the overall institutional arrangement needed for the project implementation. Mr. Trumbić displayed thematic maps and photos of the typical coastal environments and resources, and provided graphic examples of inappropriate tourism development practice in the project area. Finally, he gave a brief description of each project activity pointing out its significance and role with regard to the overall project objectives. Copies of the transparencies that accompanied the presentation are enclosed in Annex VIII.

10. The conference proceeded with the presentations of individual project activities. The first presenter was Mr. Ç. Aruoba, University of Ankara who presented the Systemic and Prospective Analysis. As a Blue Plan consultant, Mr. Aruoba took part in the mixed, national and international working team, which started its activity in the year 1992 with the report of Mr. Ayyad entitled "A Framework for Accumulating Data and Knowledge Required for the Coastal Area Management Study for Fuka-Matrouh Region". An additional important source of information was a large number of interviews that were conducted with the resourceful national experts, while, at the same time, the lack of numerical and statistical data on the area limited the extent of quantitative analyses as a methodological tool. The study elaborated the interactive relationship between development and environment in a long-term, 30 year time horizon. Geographic

reference was a wider area, the Matrouh Governorate and the Mediterranean coast of Egypt. Considering the future development paths the analysis took into account global and regional trends and impacts, and identified conflicting zones, sectors and key actors, as well as needed adjustments. Specific environmental problems were identified, the most urgent and important being the destruction of limestone ridges, coastal erosion and loss of natural vegetation. Among the economic activities building of tourist villages, for example, is related to all three problems. The population growth forecasts envisaged a rapid growth of the Matrouh city and the region based mostly on immigration, followed by the economic and social development at a faster pace than for the rest of Egypt. The most important economic activities in the area are agriculture and tourism, followed by transportation, trade and construction. Following the Blue Plan methodology, two scenarios were formulated and analysed: a trend scenario which would lead to significant environmental degradation, and an alternative scenario based on sustainable development paradigm. As a conclusion, an important role of the regional and local governments (as effective extensions of the national government) was emphasised, primarily in setting up and implementing the environmental management function. Copies of the transparencies that accompanied the presentation are enclosed in Annex IX.

11. Mr. C. Rais, SPA/RAC expert, presented their activity entitled "Specially Protected Areas – Marine and Terrestrial Ecosystems and Cultural Heritage". The objectives of the activity were to integrate natural and cultural heritage conservation with the existing and planned human activities by identifying the main terrestrial and marine ecosystems, and determining the level of their ecological sensitivity. The activities carried out included data collection on marine and terrestrial ecosystems for the coastal area from Alexandria to the Libyan border, and identification of sites of interest with special emphasis on marine vegetation, turtles and marine mammals. The first study on terrestrial ecosystems was prepared by Mr. Ayyad from the University of Alexandria, while the marine ecosystem study was prepared by the team lead by Mr. Beltagy from the National Institute for Oceanography, based on the available information, and covering, among other topics, geomorphology, bathimetry and climate, as well as all kinds of marine life. Among the sensitive marine ecosystems, Rass El-Hekma, Abu Hashafa Bay with the Matrouh lagoon are the most important ones. On the terrestrial side, seven habitats were identified with information on status, distribution and ecology, including the need for further research to bridge the baseline information gap. A detailed survey of the wider area on the marine turtles nesting occurrence (Gulf of Hekma, Abu Hashafa Bay) was carried out, and few sites were identified. Recommendations on natural resources management included measures such as:

- grazing control (including pilot and demonstration projects), as well as propagation of multipurpose and native species;
- marine meadows protection (i.e. *Possidonia oceanica*) as very important habitat with many useful roles for marine life and coastal stability.

As an important follow up activity a marine ecosystems survey was proposed. The programme is ready and SPA/RAC is prepared to contribute to its implementation. In addition, the establishment of a network of protected areas (including Ras El Hekma within the study area) along the Mediterranean coast of Egypt was proposed. All the

proposed activities should be implemented together with the local and national stakeholders, including the National Biodiversity Unit.

With regard to the cultural heritage a wider area was examined (East, West and South of Matrouh) where the major sites were analysed and the management measures proposed, including the definition of the site zoning, with a core area, exclusion zone, buffer zone, and approaches and service area. Copies of the transparencies that accompanied the presentation are enclosed in Annex X.

12. As the next speaker, Ms. I. El Bastawisi, University of Alexandria, talked about naturally attractive areas and valuable landscapes, specially from the point of view of tourism development. She presented some of those sensitive areas and proposed management measures, such as exclusion from development, establishment of buffer zones, and access regime. She also suggested setting up environmental awareness and education centres to promote natural heritage values and its protection. Mentioning the cultural heritage sites, she pointed out the need for high-quality presentation, in addition to the inherent value of the site itself.

13. During the discussion on the morning presentations, the following issues were raised:

- the need to translate the documents in Arabic and make them available to other Arabic countries, as well as to regional and local level administration,
- the need to further analyse the position of the Bedouins, and the development impacts on their future in the area,
- problem of land mines and their cleaning,
- problem of seasonallity of tourism and the need for extending the use of tourist facilities even in winter.

14. Some participants raised the question of the documentation on *Possidonia oceanica* in the Fuka-Matrouh area. Mr. Rais answered that the *Possidonia* meadows had been observed during the field trips but no specific mapping had been done. The proposed marine survey should provide more detailed information on this subject.

15. It was also emphasised that EEAA had made an extensive study on setting up new protected areas all over Egypt including the Mediterranean coast, and covering, for example, Ras El Hekma area. Nevertheless, the need exists for detailed mapping of the sensitive or attractive areas as a basis of protection measures formulation, and as input for local land-use planning.

16. During the discussion the potential of the overall development of the Fuka-Matrouh area was emphasised, including the commercial tourism and agriculture. This should attract immigrants and intensive growth which, in turn, require effective environmental management (i.e. waste treatment facilities, environmental monitoring), enforcement of EIA according to the relative laws, and adequate institutional capacity. However, some of the participants reminded that tourist season in the area is rather short, particularly compared with the Red Sea region, which inhibits developers and requires some additional attractions or incentives for the development of commercial tourism.

17. The activity on Soil Degradation and Desertification was presented by Mr. F. Abdel Kader and Mr. M. Bahnasy, University of Alexandria. The need was emphasised to pay equal attention to the hinterland area as it had been done with the coastal strip and tourism development. Accordingly, Mr. Abdel Kader pointed out the need for land information system as a planning tool to be used in regional and local land-use planning and environmental management. He briefly described two pilot areas where the in-depth study was carried out. The land information system produced comprises an inventory part, multidisciplinary in nature, covering different topics of interest (population and socio-economic data, geology, geomorphology, hydrology, climate and the like), and needed in producing synthetic information required by policy makers. Mr. Abdel Kader further briefly described seven methodology components and techniques employed during the activity. An interesting and important part of the activity was watershed analysis using special software tools and including the training courses organised with international experts. The same softwares were eventually installed at the Alexandria University and today are at the disposal of the national team. In calculating soil erosion index, parameters, such as slope and aspect, were taken into account and extracted from the Digital Elevation Model (DEM) of the area. One of the outputs was the system of physiographic units produced using, among other sources of information, photointerpretation of satellite images. These information also became part of the project GIS. Finally he presented the soil unit map describing soil types and their features, as well as the land suitability map for agriculture and grazing for two pilot sites

18. Mr. M. Raimondi, Director of ERS/RAC, presented his centre's contribution to the CAMP. He briefly introduced the ERS/RAC and its activities in the Mediterranean. He presented the working team he had worked with in the Fuka-Matrouh project, and pointed out the need for the assessment of natural resources in the study area using remote sensing, and integrating these information within the outputs of other Project activities.

19. Mr. M. El-Raey, University of Alexandria, presented the activity "Assessment of Natural Resources through Remote Sensing in the Coastal Area of Fuka-Matrouh: The Land System Map". He briefly presented different types of information on natural resources, such as quality and availability of water, climate, geology and geomorphology, as well as techniques, such as visual interpretation of satellite images for definition of general land units and field survey. The field survey covered almost fifty sample points and was needed as ground truthing in image classification process and to help in identifying homogeneous land units. He also showed the classified image for the whole area providing information on land cover and land uses in the area. Finally he presented the land units map for the whole area. In conclusion, he emphasised the usefulness of remote sensing in extracting important and consistent information on the natural resources of the study area, as well as in following changes over time and recognising trends. Copies of the transparencies that accompanied the presentation are enclosed in Annex XI.

20. Mr. F. Abdel Kader, University of Alexandria, spoke of the integration of remotely sensed and *in situ* data for the provision of soil conservation measures in the coastal area of Fuka-Matrouh. He first presented the stage in which extrapolation of data from two pilot sites to the whole area had been carried out, using different scales and data

sources. The purpose was to provide information for regional-scale policy making such as the ICAM Planning Study preparation. He emphasised the need to set up a common legend to describe the relevant features of the area. This was done during the joint work of the national teams and international team. He also presented the final maps showing soil features and land suitability for different agricultural uses. Finally, he emphasised the need for integration of more information, in addition to biophysical ones, including the socio-economic data and the local knowledge of indigenous population (the Bedouins), to be able to assist the policy makers and planners in defining land uses and proposing the best management practices. In addition, he suggested the watershed basins, 23 in the area, as appropriate spatial and management units.

21. Mr. S. Abdel Rahman, National Authority for Remote Sensing and Space Sciences, presented the activities of his organisation in the field of remote sensing at the national and regional levels, mostly dealing with projects on natural resources assessment and evaluation. An important role of NARSS is to enable transfer of high tech knowledge and information from international to national levels. He also talked about the Cairo Forum in 1998 on the Remote Sensing Techniques in Planning and Decision Making Processes for Sustainable Development, and briefly presented the proposal for land and water resources management projects consisting of three components and dealing with three areas along the Mediterranean coast of Egypt.

22. During the discussion the following issues were raised:

- the coastal erosion and climate changes impacts are important issues, and care should be taken of these phenomena (coastal erosion is one of the four main coastal issues as identified by the Framework Programme for the Development of a National ICZM Plan for Egypt);
- the use of satellite data in the study area, having in mind rather low erosion rates, is still limited, but the technology moves ahead quickly and almost in a year's time we can expect resolutions which will enable effective monitoring of this phenomenon;
- high variability and heterogeneous conditions require micro-scale generalisation which makes the land unit system very complex; and
- it would be worthwhile to investigate not only the farming systems based on traditional species, but also some innovative ones that may, for example, sustain even saline conditions which are prohibited for cereals.

23. The second day Conference started with the overview of the activities carried out by IGSR (Geographical Information Systems - GIS, Carrying Capacity Assessment - CCA, Integrated Coastal Area Management - ICAM Framework Plan, and Strategic Environmental Assessment - SEA), presented by Mr. M. El-Raey, University of Alexandria. He started with a brief coastal profile of the study area emphasising the main environmental issues including the most important one – the lack of institutional capacity to carry out an effective environmental management process. He also described the main advantages of the area including the favourable conditions for tourism development. Finally Mr. El-Raey talked briefly about each of the mentioned Project activities that would be presented during the second day of the Conference.

24. Mr. G. Berlengi, PAP/RAC consultant, talked briefly about the organisation and contents of the Geographical Information Systems (GIS) component of the Project. He pointed out the role of maps and mapping in the overall planning process, as well as for efficient and precise communication among the project team members. He also talked about the relationship between environmental information and public policy making, and emphasised the need for production of policy-oriented information to support directly planners and decision makers, and which should become part of the GIS. Another important point was the need for the present project-level GIS to evolve to an institutional system, maybe within the EEAA regional branches. Copies of the transparencies that accompanied the presentation are enclosed in Annex XII.

25. Application of Geographical Information Systems (GIS) in the Fuka-Matrouh Project was explained by Mr. M. El Hattab, University of Alexandria. He went into more detail presenting the GIS database and applications developed within the Project. He started with the description of data sources used for the database development and, in addition to traditional hard copy maps, he pointed out the remote sensing as a highly valuable source of consistent data. In addition, he mentioned GPS as a technology used to improve georeferencing of images and checking out positions of existing features on the maps. He continued by showing the examples of spatial and attribute information on the natural resources and the socio-economic features of the area. Then he presented the land suitability analysis which was based on a number of layers of different spatial data concentrating primarily on revealing the land suitable for tourism development while preserving the land suitable for agriculture. Finally, he stressed the fact that the GIS developed was a dynamic system requiring regular updating and verification.

26. Mr. G. Berlengi, PAP/RAC consultant, talked briefly about the organisation of the activity on Carrying Capacity Assessment (CCA) for Tourism and its role in the overall planning process. He stressed the importance of the decision on the amount of future tourism development within the Fuka-Matrouh Project, particularly given the present trends. That is why CCA technique was introduced and applied in the Project. In addition, an attempt was made to avoid raw calculations that pretend to deliver outputs with cold objectivity, but which are practically unusable. Instead, socio-economic and cultural parameters were introduced into the analysis to make it more realistic and comprehensive. Copies of the transparencies that accompanied the presentation are enclosed in Annex XIII.

27. Mr. S. El Kaffas, University of Alexandria, started his presentation with some background information on the study area relevant for the CCA study preparation. Than he explained the methodology and described the procedure itself. He emphasised the participation of the local population through questionnaire and field survey which were conducted to find out more about their attitude towards tourism development. The results showed that 70% of the people accepted the possibility of involvement in the tourism related activities, as well as in relevant training programmes. Copies of the transparencies that accompanied the presentation are enclosed in Annex XIV.

28. Ms. I. El-Bastawisi, University of Alexandria, went on with the presentation on CCA for tourism talking about four tourism development options and describing advantages and disadvantages of each of them. The adopted sustainable tourism development

option is based on the tourism product designed to attract both domestic and international markets, and, as a result, to extend the tourist season. At the end of her presentation Ms. El-Bastawisi presented the carrying capacities of the area according to different parameters, namely the physical and ecological parameters, the socio-cultural parameters, and the political-economic parameters.

29. The approach to the preparation of the Integrated Coastal Area Management (ICAM) Planning Study was presented by Mr. A.-K. Abdrabo, University of Alexandria. He singled out the three most important characteristics of the ICAM process, namely:

- full co-ordination among national, regional and local objectives and policies,
- integration of planning and implementation,
- public and stakeholder participation in the process.

He briefly summarised demographic and economic trends which served as a basis in making decisions on the area development concept. This concept proposed in the Fuka-Matrouh Project and shown within the study area boundaries was the result of the consideration not only of the resources and processes within the study area, but also of the whole Mediterranean coast of Egypt. The two most important external factors influencing the concept are the national population decentralisation and the dispersal of international tourist development. Copies of the transparencies that accompanied the presentation are enclosed in Annex XV.

30. Mr. A. Parpairis, PAP/RAC consultant, went on with the presentation of the ICAM Planning Study showing the overall structure or framework of a future development till the year 2020, by means of written policies and diagrammatic maps and schemes. He described the intensive, knowledge-based development concept by presenting proposed population distribution in the study area according to the population growth forecast, as well as distribution of existing and planned tourist accommodation capacities. Mr. Parpairis also emphasised the importance of the protection of the area's natural and cultural heritage, and the need to exclude those sites from the areas proposed for development. Finally, he talked about the spatial development concept consisting of mixed-use, linear peri-urban villages east and west of the Matrouh city, with tourism installations closer to the waterfront, residential or rural areas behind, and agriculture and light industry facilities (i.e. agroprocessing and handicrafts production) closer to the main transportation corridors.

31. Mr. I. Trumbić, PAP/RAC Director, introduced the Strategic Environmental Assessment (SEA) of the ICAM Planning Study. He briefly defined SEA and emphasised the particular need in case of the Fuka-Matrouh area to ensure tools to assess not only the individual projects within the usually very limited geographic area, but also the totality of development programmes or plans covering wider coastal segments (i.e. cumulative impacts of tourist villages in the whole Fuka-Matrouh coastal strip). In addition, Mr. Trumbić explained more in detail the differences between the EIA and SEA concepts and applications, particularly the different planning levels at which one or another tool is to be applied. Copies of the transparencies that accompanied the presentation are enclosed in Annex XVI.

32. Mr. W. Mohamed, University of Alexandria, complemented the presentation on the SEA of the ICAM Planning Study by emphasising the following:

- identification of the impacts of the actions proposed by the ICAM Planning Study, their magnitude and significance;
- proposal of alternative solutions and mitigation measures;
- use of the matrix method; and
- presentation of around 30 actions and 20 impacts, negative as well as positive, which were analysed.

Copies of the transparencies that accompanied the presentation are enclosed in Annex XVII.

33. In the discussion, the following issues were raised and suggestions made:

- there is the possibility and need to develop fisheries but given the diet preferences of the local population, the demand may result from either international tourism development or exportation;
- land suitability concept and application were explained in detail, particularly their importance within the planning process, as well as their complementarity with the CCA for tourism development;
- the importance of appropriate institutional and legal solutions has to be emphasised if such an ambitious Project is to be implemented;
- a comprehensive strategic plan of the north-western coast of Egypt was prepared by the General Organisation for Physical Planning and is to be adopted soon - there is a need for even more intensive co-operation and co-ordination between the physical planning and environmental management systems;
- it is important to discuss the findings of the Fuka-Matrouh Project at the National Committee for Integrated Coastal Zone Management;
- the knowledge generated during the Project should be transferred to local levels serving as a capacity building tool for managerial functions;
- following the Fuka-Matrouh action plans, the National Co-ordinator for GEF Small Grants Programme offered the opportunity to support one or two projects for community based actions.

34. The Rapporteur presented the draft recommendations of the Conference prepared by the Secretariat. Those were discussed and amended as presented in the Annex VI.

Closure of the Conference

35. Mr. M. E-Raey thanked all his colleagues and partners who participated in the preparation and implementation of the Fuka-Matrouh Project. He pointed out that without international support and consultants their task would have been very difficult, and he particularly thanked MAP and its Centres involved in the Project for their support and enthusiasm.

36. Mr. L. Chabason, on behalf of MAP, thanked the Egyptian authorities for their support to the Project. He particularly mentioned the efforts made by EEAA, the national and local teams, PAP/RAC Director and staff, BP/RAC, RAC/ERS and SPA/RAC which

contributed to the achievements of the Project. He also praised the quality of the presentations and documents that were presented during the Conference. He also thanked the Chairman for performing his task efficiently and all the participants for active involvement in the work of the Conference. He suggested that the Egyptian authorities and PAP/RAC should prepare a proposal of a set of concrete projects to be submitted to the European Commission for the consideration in the framework of SMAP.

37. The Conference was closed on June 9, 1999, at 13:30 hrs.

ANNEX I

List of participants

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ANNEX II

Agenda

Tuesday, June 8

09:00 – 09:30	- Registration of participants
09:30 – 10:00	- Welcome statements and addresses: - Mr. Ibrahim Abdel Gelil, CEO, EEAA - Mr. Lucien Chabason, MAP Co-ordinator
10:00 – 10:15	- General overview of the CAMP "Fuka-Matrouh" – by Mr. Mohamed El-Raey
10:15 – 10:45	- Presentation of the Final Integrated Report of the CAMP "Fuka-Matrouh" project - by Mr. I. Trumbić, Director of PAP/RAC
11:00 – 11:30	- Systemic and Prospective Analysis - by Mr. Ç. Aruoba, University of Ankara
11:30 – 12:10	- Specially Protected Areas – Marine and Terrestrial Ecosystems and Cultural Heritage – by Mr. C. Rais, Expert, SPA/RAC
12:10 – 12:30	- Other areas to be protected – by Ms. I. El Bastawisi, University of Alexandria
12:30 – 13:00	- Discussion
15:00 – 15:45	- Soil Degradation and Desertification – by Mr. F. Abdel Kader and Mr. M. Bahnasy, University of Alexandria
16:00 – 16:10	- ERS/RAC Contribution to the CAMP: activities, achievements and follow-up – by Mr. M. Raimondi , Director of ERS/RAC
16:10 – 16:30	- Assessment of Natural Resources through Remote Sensing in the Coastal Area of Fuka-Matrouh: The Land System Map – by Mr. M. El-Raey, University of Alexandria
16:30 – 16:50	- Integration of Remotely Sensed and *In Situ* Data for the Provision of Soil Conservation Measures in the Coastal Area of Fuka-Matrouh – by Mr. F. Abdel Kader, University of Alexandria
16:50 - 17:10	- Forum in Egypt: Support of Remote Sensing Techniques to Planning and Decision Making Processes for Sustainable Development – by Mr. M.A. Yehia, Chairman of the National Authority for Remote Sensing and Space Sciences
17:10 – 17:30	- Discussion and conclusions

Wednesday, June 9

09:30 – 09:50	- Overview of the activities carried out by IGSR (GIS; CCA; ICAM Framework Plan and SEA) – by Mr. M. El-Raey, University of Alexandria
09:50 – 10:00	- Application of Geographical Information Systems (GIS) in Fuka-Matrouh Project – Introduction by Mr. G. Berlengi, PAP/RAC Consultant
10:00 – 10:20	- Application of Geographical Information Systems (GIS) in Fuka-Matrouh Project – By Mr. M. El Hattab, University of Alexandria
10:20 – 10:30	- Carrying Capacity Assessment (CCA) for Tourism – Introduction by Mr. G. Berlengi, PAP/RAC Consultant
10:30 – 11:00	- Carrying Capacity Assessment (CCA) for Tourism – by Mr. S. El Kaffas and Ms. I. El Bastawisi, University of Alexandria
11:15 – 11:40	- Integrated Coastal Area Management (ICAM) Planning Study – by Mr. A.-K. Abdrabo, University of Alexandria
11:40 – 12:00	- Integrated Coastal Area Management (ICAM) Planning Study – by Mr. A. Parpairis, PAP/RAC Consultant
12:00 – 12:10	- Strategic Environmental Assessment of the ICAM Planning Study – Introduction by Mr. I. Trumbić, Director of PAP/RAC
12:10 – 12:30	- Strategic Environmental Assessment of the ICAM Planning Study – by Mr. W. Mohamed, University of Alexandria
12:30 – 13:30	- Discussion and lessons learned, conclusions and recommendations

ANNEX III

List of documents

1. Eid, El Mohamady; Misak, Raafat: Report on the Existing Documents of the Fuka and Siwa Areas - Egypt, Cairo, August 1990 (PAP/RAC)

2. Eid, El Mohamady: Integrated Planning and Management of Fuka Area (Egypt), Cairo, 1990 (PAP/RAC)

3. Draft CAMP Project for Fuka-Matrouh Area (Egypt), Athens, 1992 (MAP)

4. Agreement Relative to the Coastal Area management Programme for the Coastal Area of Fuka Matrouh (Egypt), Athens, October 1992 (MAP)

5. Marine and Coastal Environment - Questionnaire, Split, March 1993 (PAP/RAC)

6. Ferrari, Giovanni: Proposal for the Study of Soil Erosion and Desertification in the Management Programme for the Coastal Area of Fuka-Matrouh (Egypt), Florence, April 1993 (PAP/RAC)

7. Beltagy, Ali Ibrahim: The Marine Ecosystems of Fuka-Matrouh Area (Egypt) – Status of Species and Habitats, Tunis, 1993 (SPA/RAC)

8. Kasparek, Max: Marine Turtle Conservation in the Mediterranean – marine Turtles in Egypt – Phase I: Survey of the Mediterranean Coast between Alexandria and El-Salum, Tunis, 1993 (SPA/RAC)

9. Ayyad, Mohamed Abdel-Gawad: The Terrestrial Ecosystems of Fuka-Matrouh Area (Egypt): Status – Protection and Measurement Measures, Tunis, 1993 (SPA/RAC)

10. Fawzi, Mohamed *et al.*: Up-Dated On-Site Report for the Fuka-Matrouh Area, Egypt, Cairo, November 1993 (PAP/RAC)

11. Report of the Workshop on Geographical Information Systems in Integrated Coastal Area Management (Alexandria, November 13-18, 1993), Split, November 1993 (PAP/RAC)

12. El Guindi, Mohamed Abdel Aziz; El Din Zulfikar, Mona Salah: A Legal Study of Environmental Legislations Relating to the Fuka Matrouh Area Project, 1994

13. Report of the Training Course on Soil Survey and Aerial Photo Interpretation (Marsa Matrouh, March 11-25, 1995), Split, March 1995 (PAP/RAC)

14. Esmael, Feisal A.: Cultural Heritage Sites of the North-Western Coast of Egypt, Tunis, 1995 (SPA/RAC)

15. Aruoba, Celik: Systemic and Prospective Analysis for an Environmentally Friendly Management, 1995 (BP/RAC)

16. Ayyad, Mohamed A.: A Framework for Accumulating Consequential Data and Knowledge, Alexandria, 1995 (BP/RAC)

17. Implications of Climatic Changes on the Coastal Area of Fuka-Matrouh - Draft, Athens, 1995 (MAP)

18. Land Based Sources of Pollution in Matrouh-Fuka Area, National Institute of Oceanography and Fisheries, Alexandria, 1995 (MEDPOL)

19. Assessment of Land Resources Supported by Remote Sensing, Palermo, September 1995 (RAC/ERS)

20. Abdel-Kader, Fawzi, *et al.*: Soil Degradation and Desertification – Final Report, January 1996 (PAP/RAC)

21. El-Raey, Mohamed, *et al.*: Inventory GIS Database and Sustainability Analysis of Fuka-Matrouh Area (Egypt), Alexandria, December 1997 (PAP/RAC)

22. El-Raey, Mohamed, *et al.*: A Framework for Integrated Coastal Area Management Plan of Fuka-Matrouh Area (Egypt), Alexandria, June 1998 (PAP/RAC)

23. El-Raey, Mohamed, Fawzi Mohamed, *et al.*: Strategic Environmental Assessment of the Integrated Coastal Area Management Plan of the Fuka-Matrouh Area (Egypt), Alexandria, December 1998 (PAP/RAC)

24. Integrated Coastal Area Management Planning Study for Fuka-Matrouh Area, April 1999 (PAP/RAC)

25. Carrying Capacity Assessment for Tourism Development in Fuka-Matrouh Area, June 1999 (PAP/RAC)

26. Assessment of Natural Resources and Soil Conservation Issues in the Coastal Area of Fuka-Matrouh, June 1999 (PAP/RAC – ERS/RAC)

27. Final Integrated Report of the Coastal Area Management Programme "Fuka-Matrouh – Egypt", June 1999 (PAP/RAC)

ANNEX IV

Opening Statement by Mr. Ibrahim Abdel Gelil
Chief Executive Officer of EEAA

It gives me great pleasure to welcome you today to this conference which marks an important milestone in the Coastal Area Management Programme. I would like to take this opportunity to acknowledge the high level of expertise and the dedicated efforts of the Fuka Matrouh project team throughout its implementation. I would also like to commend UNEP on its regional partnership initiatives which have effectively signalled to us – over the years – shared environmental concerns, green opportunities and global issues regarding our common future.

In 1975, twenty coastal states – including Egypt – and the European Union, signed an international agreement of great significance to all of us sharing the Mediterranean, that is the Barcelona Convention. Since then, a number of concrete programme agendas have been developed to operationalise the Convention, one of which is the Mediterranean Action Plan. The MAP is a clear expression of the level of alliances that is required at a regional, national and local level to address the complexity and interaction of issues relating to coastal zone management.

By the beginning of the next millennium, our shared Mediterranean will be accommodating approximately 600 million inhabitants. Three thousand years ago, this same Mediterranean set the basis of our geographical and social map that governs our interactions today. This is the reason why countries of the Mediterranean region are expressing a strong will to set the first world model for an ecoregion. However, will is not enough. I call upon our partner countries to act in progressive and uninterrupted complementarity of individual initiatives, to pursue a future path of action guided by environmental alternatives and consensus.

On a national level, we are promoting partnerships and alliances as a policy tool to realise our objectives in the long and immediate terms. We are effectively doing so through engaging with other ministries, governorates, the private sector, local communities and non-governmental organisations in practical interventions to resolve pollution problems and attain better environmental standards.

Our commitment to implementing Egyptian environmental laws is clear and our strategy to realise that commitment relies on a compliance and enforcement agenda of programmes and projects. These revolve around the principles of effective co-ordination and setting up a strong environmental infrastructure promoting decentralisation of environmental management and monitoring that would ultimately support the sustainability of environmental initiatives.

Our constructive participation in the Mediterranean Action Plan has brought forward a number of priorities that need to be assessed and acted upon. We have certainly benefited through the process in terms of our human resource, information and institutional capacity development in this field. The Fuka Matrouh experience lends itself to replicability in a number of equally vulnerable locations along the Mediterranean coast.

For all of these reasons and more, I shall be looking forward to our continued dialogue on how to further our co-operation. Perhaps the most important lesson that we have learned through our involvement with the Mediterranean Action Plan is that the range of stakeholders extends beyond political and institutional walls. There is plenty of room for non-governmental organisations, universities and others to network for a transitional collaboration to approach the totality of the environmental challenges that we are facing.

I trust that the process and the various outputs of this project will be openly shared by our speakers with the purpose of assisting us in setting new environmental targets to recover our Mediterranean.

I thank you for your attention and look forward to the outcome of your discussions.

ANNEX V

Statement by Mr. Lucien Chabason
Co-ordinator of MAP

First of all allow me to avail myself of this opportunity to welcome all of you on behalf of the Executive Director of UNEP, Mr. Klaus Toepfer. May I also express on behalf of UNEP/MAP our gratitude to H.E. Ms. Nadia Makram Ebeid, the Minister of State for Environment of Egypt, to Mr. Ibrahim Abdel Gelil, Chief Executive Officer of the Egyptian Environmental Affairs Agency (EEAA), to Mr. Ahmed Abou El-Azm, Head of Environmental Management Sector of the EEAA, for their continued and encouraging support during the implementation of the Fuka-Matrouh CAMP project. My thanks go likewise to H.E. Mr. Kamal Amer, the Governor of Matrouh, and Professor Mohamed El-Raey, Dean of the Institute for Graduate Studies and Research of the University of Alexandria, and his national and local teams for their strong support and involvement during the implementation of the project.

During the first decade of the Mediterranean Action Plan (MAP), it was recognised that the bulk of MAP's activities had 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 harmonisation 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, was viewed as the most concrete and practical phase of Mediterranean co-operation.

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 projects within the Coastal Areas Management Programme were selected in co-operation with the Mediterranean coastal states. The Fuka-Matrouh project was one of these twelve projects. The philosophy behind these coastal projects was to help the states define, or redefine, the development of problem areas while respecting the environment; mobilise towards this end national investments and promote greater international co-operation. The financial interventions of the World Bank, and the European Investment Bank in other CAMP projects was a clear example.

With regard to the Fuka-Matrouh CAMP, the general strategy was 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 have led to the preparation of an environmental management plan, integrating all knowledge gained through individual actions, with an objective of protecting, rationally utilise and ensure sustainable management of natural coastal and marine resources, over a relatively long period of time and resolving the existing CAMP

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 was expected to provide the following benefits:

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

CAMP is the MAP programme with the objective to develop planning and management strategies for a sustainable development of Mediterranean coastal and marine resources. As such, the Programme promotes and supports national coastal management initiatives in building relevant institutional and human capacities.

The Programme provides, and it has been doing so in Egypt, to all MAP Regional Activity Centres (RACs) and MEDPOL the opportunity of a harmonised joint practical work with the host country national and local authorities, institutions and scientific community, demonstrating the capacity for integration and application of the best methodologies and tools in real conditions.

According to the Agreement between the Egyptian Government and MAP, signed at the end of 1992, MAP agreed to implement the Project in order to tackle major problems and issues in the Fuka-Matrouh area. It was important that the proposed study area with its problems and concerns be representative of the wider Mediterranean coastal region of Egypt. The main problems and issues include:

- Uncontrolled development of tourism (intended for the domestic market as summer houses) which mostly excludes the local population as beneficiaries while producing negative impacts on the natural environment and infrastructure.
- Complex natural conditions that require sensible agricultural policies, whose main beneficiaries should be the native population, Bedouins.
- Ecologically and environmentally sensitive areas, as well as valuable cultural heritage.
- Absence of an effective land-use planning and development control system, as well as a participatory approach in overall development planning.
- Lack of environmental awareness.

Accordingly, a long-term objective of the Project was setting up of a system of integrated planning and management of resources in the area, as well as to support efforts towards the development of a national coastal management programme. The immediate objective of the Project was to provide solutions to development and environment problems of the most urgent nature which could be implemented in short period.

As a matter of fact, during the Project implementation, the Framework Integrated Coastal Zone Management (ICZM) Programme for Egypt was prepared in 1996. It defined the basic institutional and legal arrangements, and the Fuka-Matrouh Project fits into that framework. The communication between the Fuka-Matrouh Project and the on-going national Coastal Zone Programme was made easy by the fact that the EEAA was in charge of co-ordinating both the overall national activities of the national and local teams working on the Fuka-Matrouh Project.

The Project was composed of two groups of activities: those primarily sectoral, focused on individual topics or issues which mostly make the analytical part of the planning process, and the activities which integrate the information and knowledge gained in the analytical phase in outputs, such as Carrying Capacity Assessment (CCA), ICAM Planning Study, and Strategic Environmental Assessment (SEA).

The first group produced as comprehensive, precise and value-free information as possible to support decision and policy making in the second stage of the planning process. The second phase of the planning process synthesised the collected information and produced an integrated physical development strategy at a regional level (ICAM Planning Study), and formulated a management strategy including legal and institutional aspects, as well as action plans.

With regard to the individual activities, some of them brought in innovative methodologies and tools that proved to be useful and applicable, such as:

- assessment of land resources – characterised by holistic approach and methodology that combined high-tech remote sensing technologies with field surveys and laboratory work to produce valuable and cost-effective information,
- strategic environmental assessment (SEA) – an important issue in case of the coastal development of the Fuka-Matrouh area was the need to ensure tools to assess not only the individual project impacts within the usually very limited geographic area, but also whole development programmes or plans covering wider coastal segments (i.e. additive impacts of tourist villages in the whole Fuka-Matrouh coastal strip).

The Integrated Coastal Area Management (ICAM) Planning Study is the main output of the Fuka-Matrouh CAMP project that synthesised all the knowledge and recommendations gained by individual activities and sectoral studies. The development concept proposed in this Study and shown only within the study area boundaries is the result of the consideration of the wider regional and national context. This concept envisages the creation of an important development pole in the western coastal region. Instead of individual tourist resort projects sneaking into the coast and silently using it up, mostly excluding the local population as beneficiaries, the proposed concept aims at a comprehensive development of the western coastal region. This regional development concept has the following main objectives:

- to support the national policies, such as a population decentralisation from the overpopulated Nile valley, and equitable distribution of international tourist development benefits nation-wide,
- to introduce measures and technologies to develop most of the land suitable for agriculture (including the restoration of rangeland) to revitalise the rural, mostly Bedouin communities, and take advantage of their intimate knowledge of this environment,
- to ensure diversification of the tourist product and activities (larger share of commercial and international tourism) providing for more jobs in tourism as well as in other tourism related sectors,
- to ensure protection of the area's natural and cultural heritage.

The Fuka-Matrouh area is a good example of the area where an integrated coastal management plan is needed because of negative development trends, conflicting issues and complex management problems. One of the project key words is integration – when relevant authorities and disciplines have to co-operate, and at the implementation stage – so called vertical integration – when different levels of government should pull together.

To this end, an important project recommendation is that the power of the existing line agencies should be balanced with the real operational powers of co-ordinating bodies such as the National Committee for ICZM.

While the Fuka-Matrouh project has provided a comprehensive scientific and technical analysis, and proposed an ambitious, intensive and knowledge-based regional development concept, there are, as just mentioned, numerous administrative and socio-political issues that should be resolved if the coastal management goals are to be achieved.

Within the specific activity related to the application of remote sensing techniques within the Fuka project, the objective was the assessment of soil and water resources in the studied area, in order to support local authorities to set up management and development plans based on the knowledge of the real capability of the area.

To achieve this aim, the MAP intervention, through its Centre for Remote Sensing (ERS/RAC), was based on a multidisciplinary approach integrating remotely sensed data, direct *in situ* measurements and book and cartographic material.

Capacity-building and training-on-the-job of local experts was also carefully performed as a main priority of this multidisciplinary intervention.

The main outputs were a Land system Map produced relying on commercial GIS software facilities and a Landsat Image of the concerned area, used for the carried-out work and transferred to the Egyptian counterpart.

The activity was also aimed at providing the Egyptian authorities with proper methods and effective systems to support decision-making processes for the sound planning and sustainable development of coastal areas.

As an outcome of this co-operation with Egyptian scientists and institutions, some recommendations to local authorities were jointly made, highlighting that management and equilibrating land between agriculture and development is one of the most serious land planning issues in the years to come.

In this connection, the following considerations were also made:

- portions of land could be reallocated to grazing without significant losses in agricultural production; especially in southern inland areas. However, if these surfaces would be negligible for agriculture, they would also be negligible for grazing, that works on a much larger scale;
- the improvement of pastures, by introducing new species able to grant a better cover and to reduce soil erosion, should be carefully balanced against the risk of reducing contributions of runoff water to downstream croplands. This balance can be considered at a watershed level in the coastal lowlands, while, unfortunately, this is not possible in the Plateau, where a realistic reconstruction of watershed borders was not allowed;
- preservation of backshore saltmarshes would imply limitations to agricultural water management in the watershed upstream from the marshes themselves, so creating a conflict.

A further recommendation was that the experience gained in the CAMP area should be extended to other Egyptian coastal areas experiencing similar environmental issues and development plans.

On the whole, all of the Mediterranean bordering countries could benefit by using the applied methodologies and tools for a better knowledge and understanding of the environmental state and of those actions to be implemented for keeping a sound environmental balance in coastal areas.

As a follow-up to its interventions in the CAMP area, the MAP-ERS/RAC, in the framework of its capacity building activities addressed to the Mediterranean countries, arranged a "National Forum on Support of Remote Sensing Techniques to Planning and Decision Making Processes for Sustainable Development in Egypt" with the co-operation of the Egyptian Environmental Affairs Agency (EEAA) and of the National Authority for Remote Sensing and Space Sciences (NARSS).

As a result of the "Forum" initiative, it was possible to identify clear guidelines for conceiving new joint undertakings based on the use of advanced technologies and aimed at setting up suitable information systems supporting planning and decision-making activities.

Another important activity was related to the protection of the ecosystems and species in the Fuka-Matrouh area, with the objectives to: (i) collect data on ecosystems and species (marine and terrestrial);(ii) identify sites of natural and cultural interest and to propose measures for their conservation and management; (iii) to assess the status of rare and/or endangered species; and (iv) to promote the training of local experts in habitat surveying techniques and management.

In carrying out these activities, the MAP Centre for Specially Protected Areas (RAC/SPA) obtained an important participation of local experts (from NIOF and the Alexandria University) jointly identified with the EEAA.

The studies revealed that present knowledge on marine ecosystems in the project area was low, but the available data show that the main Mediterranean habitats, assemblages and species are represented. Considering the scope and the budget of the CAMP project, it was not possible to undertake detailed field study and mapping of marine habitats. A detailed programme for data collection through surveys at sea was elaborated and is proposed as a follow-up activity of the CAMP project.

Like for the western Mediterranean coastal of Egypt, fishing is not developed in the project area, but potential is high. However, it was recommended that the future development of the fishing sector should not be developed in separation, without due consideration of the conservation of sensitive marine habitat. Special attention should be paid to the *Posidoina* meadows which are among the main components of marine biodiversity in the area. The need of *Posidoina* meadow conservation comes not only from the ecological viewpoint, indeed the habitat built by the species is essential for the growing of several species including those targeted by fishermen. Therefore, conservation of such habitat will provide significant contribution to the sustainability of the fishing sector itself.

As far as terrestrial ecosystems are concerned, the study confirmed that the region is characterised by considerable diversity of habitat and land-use. Some habitats are characterised by greater diversity in microhabitats that others due to the heterogeneity of landform, and, accordingly, exhibit greater diversity of plant species with several endemic species. Overgrazing and inappropriate cultivation practices appear as the main, but not the unique, causes of degradation. The study carried out within the framework of the CAMP project proposes the following main recommendations to face the loss of terrestrial habitats and species erosion:

- Establish pilot areas for protection and controlled grazing in each of the main habitats and communities;
- Initiate appropriate systems for grazing management involving the land-users and local authorities;
- Develop an extensive programme for propagation of endangered plant species;
- Establish and manage nature reserves to protect the habitats which are representative of the region. A simple abandonment to facilitate regeneration would only lead to further degradation.

It is essential to obtain the participation of local land-users in the implementation of the above mentioned recommendations.

There is only one protected area in the Mediterranean coastal zone of Egypt, between Alexandria and the Libyan border (El Omayed nature reserve, established in 1986). The CAMP project identified several sites of natural interest which should be granted a protection status (or at least some of them) under law 4/1994. Based on the local experience, gained in the management of the El Omayed nature reserve and the marine parks south of Sinaï, the development of protected areas on the western Mediterranean

coastal zone of Egypt will contribute in the sustainable development of the area. It will be difficult to reach a balanced situation between tourism development and conservation of habitats and landscapes along this coast of Egypt. However, in the CAMP project area there are actual opportunities for that. This is the case of Ras El-Hekma area identified as site of high interest from ecological and landscape viewpoint. The first presentation meeting on the CAMP Fuka-Matrouh project, held in Matrouh in 1995, recommended the establishment of a protected area on the site which is also designated for tourism development by the Ministry of Tourism. The investigations undertaken within the CAMP project show that part of it could be preserved as nature reserve and protected landscape while the other part will be used for tourism facilities. A buffer zone with traditional agriculture could be added to the core area on the terrestrial part of the site. The length of the coastline proposed for conservation is about 10-15 km.

I do not want to continue further on this introductory statement, the outputs of the project will be presented in the course of today and tomorrow. However, it is also envisaged that two or three important activities need to be followed up through adequate financial support of relevant international financial institution or programmes.

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

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

Concluding this introductory statement, I would like to emphasise that two important environmental events are being taking place these days. The first was the World Environment Day on the 5th of June, and the second is the Mediterranean Environmental Week from 5 to 12 June 1999.

As stated by the UN Secretary-general in his World Environment Day message "The theme for this year's World Environment Day – Our Earth – Our Future – Just Save It, is an urgent appeal to each and everyone of us to renew our pledge to cherish and respect the planet that sustains us".

Moreover, the words of the Executive Director of UNEP, Mr. Klaus Toepfer, on this occasion closely reflect what we are doing within the Fuka-Matrouh CAMP project, when he said that "On this World Environment Day, I would like to call on every sector of society – governments and non-governmental organisations, individuals and community groups, business and industry, faith communities and civil society at large – to take those adequate steps, because it is at the local and national level where action to protect the environment acquires its full meaning. Participation at the community level is a precondition for promoting and achieving global results".

Finally, I would like to thank you once again for your participation and your kind attention.

ANNEX VI

Recommendations of the Conference

Prepare ICAM regional plan with special reference to the designation of protected areas and other preserved open coastal spaces, designation of land for agriculture, and reservation of areas for tourism within the carrying capacity.

Establishment of an environmental information centre to collect data from available sources and generate policy oriented information.

Upgrade the capacity of the local environmental management authority to collect and update data including remote sensing and GIS, and other tools.

Disseminate approaches, results and experiences gained within the Project to national and international stakeholders.

Carry out detailed survey of regional marine environment, prepare a detailed, mapped resource inventory, and prepare proposal and a management plan for Ras El Hekma protected area which would be included in the network of Egyptian Mediterranean protected areas.

Carry out public awareness raising projects at community level with regard to naturally sensitive areas.

LIST OF PROJECT OUTPUTS

1. Eid, El Mohamady; Misak, Raafat: Report on the Existing Documents of the Fuka and Siwa Areas - Egypt, Cairo, August 1990 (PAP/RAC)
2. Eid, El Mohamady: Integrated Planning and Management of Fuka Area (Egypt), Cairo, 1990 (PAP/RAC)
3. Draft CAMP Project for Fuka-Matrouh Area (Egypt), Athens, 1992 (MAP)
4. Agreement Relative to the Coastal Area Management Programme for the Coastal Area of Fuka Matrouh (Egypt), Athens, October 1992 (MAP)
5. Marine and Coastal Environment - Questionnaire, Split, March 1993 (PAP/RAC)
6. Ferrari, Giovanni: Proposal for the Study of Soil Erosion and Desertification in the Management Programme for the Coastal Area of Fuka-Matrouh (Egypt), Florence, April 1993 (PAP/RAC)
7. Beltagy, Ali Ibrahim: The Marine Ecosystems of Fuka-Matrouh Area (Egypt) – Status of Species and Habitats, Tunis, 1993 (SPA/RAC)
8. Kasparek, Max: Marine Turtle Conservation in the Mediterranean – Marine Turtles in Egypt – Phase I: Survey of the Mediterranean Coast between Alexandria and El-Salum, Tunis, 1993 (SPA/RAC)
9. Ayyad, Mohamed Abdel-Gawad: The Terrestrial Ecosystems of Fuka-Matrouh Area (Egypt): Status – Protection and Measurement Measures, Tunis, 1993 (SPA/RAC)
10. Fawzi, Mohamed *et al.*: Up-Dated On-Site Report for the Fuka-Matrouh Area, Egypt, Cairo, November 1993 (PAP/RAC)
11. Report of the Workshop on Geographical Information Systems in Integrated Coastal Area Management (Alexandria, November 13-18, 1993), Split, November 1993 (PAP/RAC)
12. El Guindi, Mohamed Abdel Aziz; El Din Zulfikar, Mona Salah: A Legal Study of Environmental Legislations Relating to the Fuka Matrouh Area Project, 1994
13. Report of the Training Course on Soil Survey and Aerial Photo Interpretation (Marsa Matrouh, March 11-25, 1995), Split, March 1995 (PAP/RAC)
14. Esmael, Feisal A.: Cultural Heritage Sites of the North-Western Coast of Egypt, Tunis, 1995 (SPA/RAC)
15. Aruoba, Celik: Systemic and Prospective Analysis for an Environmentally Friendly Management, 1995 (BP/RAC)
16. Ayyad, Mohamed A.: A Framework for Accumulating Consequential Data and Knowledge, Alexandria, 1995 (BP/RAC)
17. Implications of Climatic Changes on the Coastal Area of Fuka-Matrouh - Draft, Athens, 1995 (MAP)
18. Land Based Sources of Pollution in Matrouh-Fuka Area, National Institute of Oceanography and Fisheries, Alexandria, 1995 (MEDPOL)
19. Assessment of Land Resources Supported by Remote Sensing, Palermo, September 1995 (RAC/ERS)
20. Abdel-Kader, Fawzi, *et al.*: Soil Degradation and Desertification – Final Report, January 1996 (PAP/RAC)
21. El-Raey, Mohamed, *et al.*: Inventory GIS Database and Sustainability Analysis of Fuka-Matrouh Area (Egypt), Alexandria, December 1997 (PAP/RAC)

22. El-Raey, Mohamed, *et al.*: A Framework for Integrated Coastal Area Management Plan of Fuka-Matrouh Area (Egypt), Alexandria, June 1998 (PAP/RAC)

23. El-Raey, Mohamed, Fawzi Mohamed, *et al.*: Strategic Environmental Assessment of the Integrated Coastal Area Management Plan of the Fuka-Matrouh Area (Egypt), Alexandria, December 1998 (PAP/RAC)

24. Integrated Coastal Area Management Planning Study for Fuka-Matrouh Area, April 1999 (PAP/RAC)

25. Carrying Capacity Assessment for Tourism Development in Fuka-Matrouh Area, June 1999 (PAP/RAC)

26. Assessment of Natural Resources and Soil Conservation Issues in the Coastal Area of Fuka-Matrouh, June 1999 (PAP/RAC – ERS/RAC)

27. Final Integrated Report of the Coastal Area Management Programme "Fuka-Matrouh – Egypt", June 1999 (PAP/RAC)

28. Report of the Final Presentation Conference for the CAMP "Fuka-Matrouh" (Cairo, June 8-9, 1999), August 1999 (PAP/RAC)

29. Eid, El Mohamady; Misak, Raafat: Report on the Existing Documents of the Fuka and Siwa Areas - Egypt, Cairo, August 1990 (PAP/RAC)

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37. Ayyad, Mohamed Abdel-Gawad: The Terrestrial Ecosystems of Fuka-Matrouh Area (Egypt): Status – Protection and Measurement Measures, Tunis, 1993 (SPA/RAC)

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51. El-Raey, Mohamed, Fawzi Mohamed, *et al.*: Strategic Environmental Assessment of the Integrated Coastal Area Management Plan of the Fuka-Matrouh Area (Egypt), Alexandria, December 1998 (PAP/RAC)

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ANNEX I

INTEGRATED COASTAL AREA MANAGEMENT PLANNING STUDY

UNEP

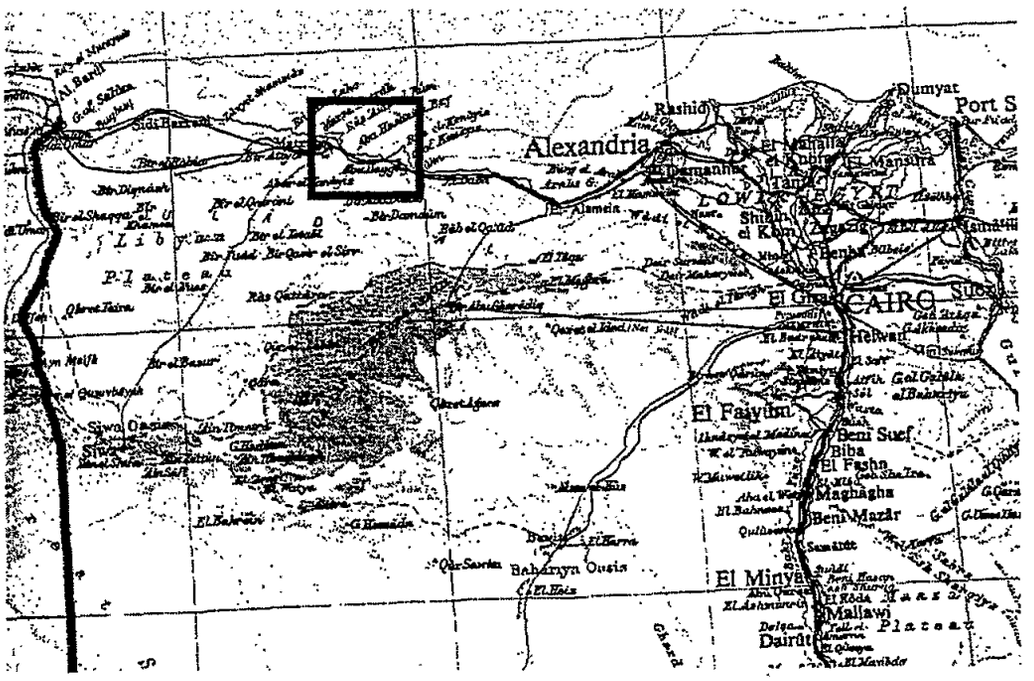
UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN

MAP

PRIORITY
ACTIONS
PROGRAMME

Coastal Area Management Programme (CAMP)
FUKA-MATROUH - Egypt

INTEGRATED COASTAL AREA MANAGEMENT PLANNING STUDY



Priority Actions Programme
Regional Activity Centre
Split, June 1999

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ACKNOWLEDGEMENTS

This document was prepared in the framework of the MAP Coastal Area Management Programme "Fuka-Matrouh" Project. It was based on a number of sectoral studies, and particularly "A Framework for Integrated Coastal Area Management Plan Fuka-Matrouh (Egypt)" prepared by the national team of experts from the University of Alexandria led by Prof. Mohamed El-Raey.

EXECUTIVE SUMMARY

The concern for the coastal resources has increasingly risen during the last two decades mainly because of the great pressure of human actions – urban expansion, industry, tourism and recreation, fisheries and aquaculture, ports and marinas, energy production and transportation, infrastructure, etc. – but also due to ineffective policies, planning and management tools in controlling or regulating human actions and natural processes (natural risks and hazards) in such sensitive environments as coastal zones. As a result of the uncontrolled human presence and extensive exploitation of the marine resources, destruction of historic and architectural heritage, loss of public access to the coast, pollution and congestion, especially in the Mediterranean basin – where the harmful impacts of these actions are visible all over the region – a worldwide concern has developed regarding how to deal with conflicts over land use policies, how to apply the principles of sustainable development, and how to introduce an integrated coastal and marine areas planning and management.

Within this concern, the Government of Egypt and the Mediterranean Action Plan (MAP) signed, in September 1993, an "Agreement on the Implementation of the Coastal Area Management Programme for the Area of Fuka – Egypt". The ICAM Planning Study preparation is the most important component of the CAMP, and will be drawing upon the results of all the previous sectoral studies. The area covered by the ICAM Planning Study is the section of the coast between the village of Fuka and the town of Marsa-Matrouh, approximately 70 km wide.

According to the above agreement, the consultants' job, through two missions in Egypt, was to analyse and compile information from different agencies and sectoral activities and to provide planning and management proposals and solutions for the sustainable development of the study area. The final product of the activity is the ICAM Planning Study providing strategies and management guidelines as a framework for a more detailed coastal management and land use planning to be undertaken in a second phase.

This document – the ICAM Planning Study and Strategy – is the result of the first phase, based on a participatory process as well as on sectoral reports and research findings, facilitated by a multi-agency and consultancy team including two national teams at Alexandria and Marsa-Matrouh, and a number of agencies and experts.

This ICAM Planning Study process initiated in the Fuka-Matrouh coastal area has been based on the MAP/PAP guidelines, and has built a co-ordination mechanism which is going to translate **project activities** in the Fuka-Matrouh area and the **policy objectives** (national, regional and local) into specific tasks and responsibilities within the decision-making authorities structures, which will provide the necessary **links** of the various activities to support each other towards **effective** and **continuous** co-ordination/co-operation.

Accordingly, the **principal goal** of this document is to provide a safe ground for the whole process of cutting across sectoral boundaries (authorities, agencies and activities), and incorporating the interactions between the coastal natural resources, and those of socio-economic influences affecting the coastal environment.

It is the need for **integration** – an issue which has been addressed from the beginning of the ICAM process – that the **analysis of the coastal profile** has been covered in detail during the preparation of the ICAM Planning Study in which **the identification of the main environmental problems**, the examination of the way that the **whole system of resources** of the project area is developed, and especially the land uses of the sensitive coastal environment, as well as the evaluation of the **limitations** (organisational, legal, traditional ways of behaving) involved in the system we are considering in this plan will be dealt with.

The structure of the report is moving through the following steps of the context, goals and objectives; methodology; the area profile, constraint and opportunities; proposed alternative scenarios; and certain conclusions addressing strategic EIA, Carrying Capacity Assessment proposals for a structure plan, as well as planning and management tools and guidelines.

Accordingly, the principle aim of this document is to apply the **first step of the ICAM** Planning Study and programme, which is approached mainly through the synchronisation of the necessary planning of multiple issues in the coastal areas under consideration of overlapping interest, while during the second phase it is expected to be approached in a more detailed way through the collection of more accurate data, maps and information needed, as well as more public involvement and results of some task force actions.

Finally it would be useful to mention in advance that **environmental aspects** have been the **focus motive** for the proposed alternative scenarios and of the selected one for handling the coastal area's main problems and issues. The proposed harmonious framework of this northern Mediterranean Egyptian region of mixed land use types of development demands an **urgent action** for implementation, not only of the main findings of this report, which can be in any case tested in practice, but also of the main components of the next phase of the ICAM Planning Study and Strategy, since the expectations are great and the future perspectives for the study area, are very challenging.

1. INTRODUCTION

The need for **integration of planning and management actions and processes in sensitive coastal areas** is now widely accepted and of course well documented in many activities already undertaken in several cases. This ICAM Planning Study for Fuka-Matrouh is a similar job, designed to response to this need and also to stress the urgency of an action to mobilise all the **actors** concerned with the future of the Mediterranean coast.

However, we are all aware at the fact that this kind of operations are quite often diverse and originate from many actors both in the public and private sectors. In most cases, as in this we are examining here, these are not considered or co-ordinated enough. A conscious effort to introduce **integrated planning** and **management process** is now seen as one means of **securing balance, sustainable development** and **conservation planning,** especially in the coastal zone.

Meanwhile this ICAM Planning Study should be seen also within the framework of the global efforts, including that of the favourable reception that it has already received from various organisations such as the UN and the EU, on the **common interests of environmental protection,** and move specifically with the future of the coastal resources. In this evaluation, we are going to examine the impact (effect) at certain policies in relation to key mankind actions in the process of the exploitation of natural resources with which they are correlated (Figure 1).

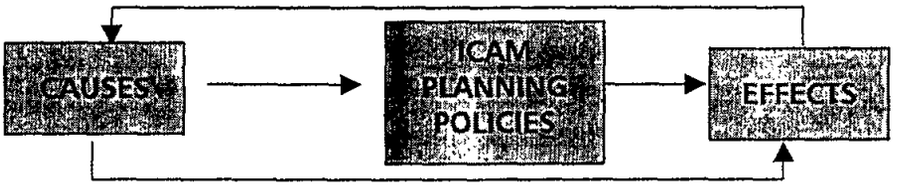

Figure 1: The Impact Policy Effect System

Therefore the **principal aim** of this document is to assist the initial discussion of the main theme which comprises the previous work (CAMP reports), and also to address a key mechanism to improve the whole process. Accordingly, the role of this mechanism will be to achieve:

a) **Co-ordination of human actions (public, private, etc.);**

b) **integration of management and planning;**

c) **balance of competing views; and**

d) **sustainable use of coastal resources.**

In spite of the fact that these **roles** are not always common to planning and management process – there is long history of the use of the meaning of **"balance"** for example – nevertheless they should be seen as roles converting **consensus** and **positive actions** into policy, while avoiding the consequences of failure to resolve rather contending positions which, as we are all aware, always exist in planning and management activities.

However, it is important to mention here the fact that **most of the necessary information**, data, plans and documents, concerning the present as well as the future status of land use planning policy and development of the area, as well as that of the adjacent area/region, are all very crucial documents in examining the **future trends, dynamics** and the forces affecting the area's environment. However, most are still not available in a detailed way, and accordingly, this ICAM Planning Study should be seen rather as an attempt towards a more fully document in a better future shape.

The Marsa Matrouh – Fuka area is located within the Governorate of Matrouh and occupies part of the north-western region of Egypt. The area has been defined by the agreement of MAP and the Egyptian Government (September 1993) and covers a 100 km long north-western Mediterranean coastal stretch of Egypt. It starts from the city of Marsa Matrouh and ends at the site of Fuka situated 210 km to the west of Alexandria (Map 1). The depth of the project area is rather narrow and ranges from 10 to 15 km from the Mediterranean cost to the Saloum road and railway to the inland. For the purpose of meeting successfully the needs of the land use planning policy of the area and the adjacent one, it is possible to expand the project area to 30 km (altitude 31° 05′ N) from the coast to the elevated structural plateau in the south (altitude 30° 50′ N) so that to cover the stretch to the Mill road (Maps 1, 2). Additionally, an expansion area of about 30 km should be considered west of Matrouh and east of Fuka.

The project area is located in the middle upper portion of the Governorate of Matrouh, one of the largest of Egypt with and area of 212,111 km^2, representing about 22% of Egypt's area. On the other hand, in terms of **population,** the Governorate is one of the smallest of the country. According to preliminary results of census, its population amounts to about 211,966 (in the 1986 census the population was 160.000, which means that we have an increase of 32% over 13 years), which represents a population **density** of less than one person per km^2. The boundaries of the Matrouh Governorate (region), rectangular in shape, are:

- The **Eastern** border extending from the limits of the Alexandria Governorate at El Hamman on the Mediterranean sea, to the south along the border of the Beheira, Giza and Beni Suef Governorates;
- The Libyan border on the **West** extending for about 400 km from El. Salloum to the longitude 20° 30′ south of the Siwa oasis;
- The Mediterranean Sea on the **North** extending for about 500 km from El. Hamman to El. Salloum; and
- The **Southern** border in the new Valley Governorate extending from the longitude 28° 30′ to the border of the Beni Suef Governorate.

Administratively, the Matrouh Governorate is divided into five (5) **districts** (Markaz), while the city of Marsa Matrouh is excluded, which are from east to west: **El-Hamman** (previously Burg El-Arab already included into Alexandria Governorate), **El-Dabaa, Matrouh, Sidi Barrani,** and **El-Salloum**. Internally, Matrouh is divided into **East Matrouh,** from Fuka to the M. Matrouh City, and **West Matrouh,** from the M. Matrouh City to Marsa Negila.

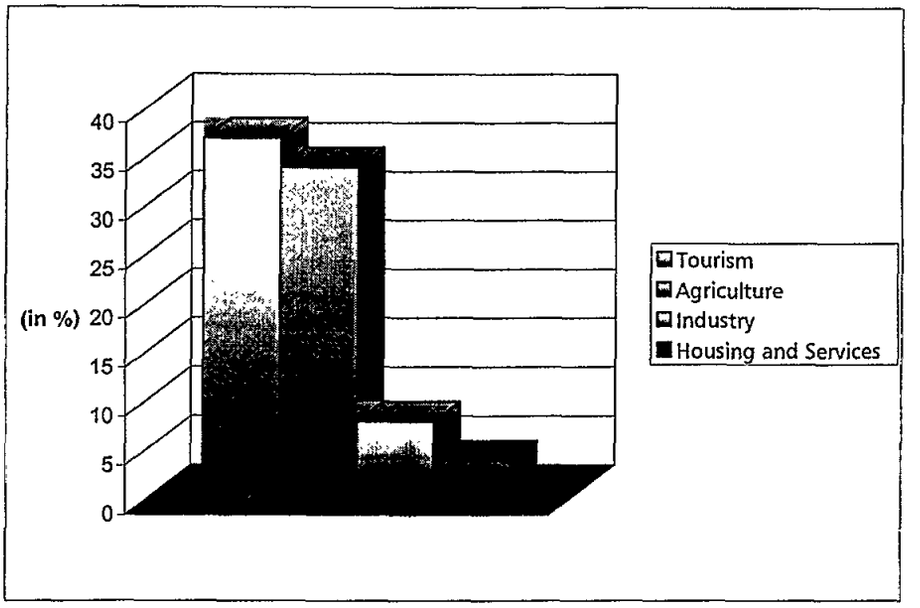

Figure 2: Investment Plan Structure, 2010

The Governorate of Matrouh is mainly regarded as a rather **poor region** where the **activities,** and accordingly, the sources of **income,** are in the following order of significance: **agriculture, pasturing, tourism** and other activities. However, because of insufficient rain, the main local income coming from agriculture and pasturing (for a long time the main source of income in this coastal region) is characterised by uncertainty. This fact justifies the trend to diversity the activity and the sources of income with more emphasis on the sectors of agriculture and tourism. Tourism in particular is the most expanding activity in the area. Large development projects are under construction along the coastal strip.

Tourism represents the highest proportion of estimated investment (tourism 262, agriculture 220, out of the 703 grand total – L.E.000,000) by year 2010. According to the Investment Plan (A. Ayyad. 1995) the investment in **agriculture** is equivalent to 34% and in tourism approximately 37%. The rest sectors represent only 29%, of which industry 8% and housing, services and infrastructure 21%.

The total investment plan gives 58% to the construction sector, which emphasises the importance of this sector for development, including tourism, housing and infrastructure, while the **agricultural sector** continues to be considered as the **basic component** of the area's economy, with corresponding distribution and relocation of **land uses** in general. It is important to mention here the importance of examination of the spatial character of the National Investments distribution plan, which determines, in a degree, the **land use profile** of the Matrouh Governorate.

2. GOALS AND OBJECTIVES

The main goal of the ICAM Planning Study, as a process, is to build a co-ordination mechanism which is going to translate **project activities** in the Fuka-Matrouh are **and policy objectives** (national, regional and local) into specific tasks and responsibilities within the decision-making authorities structures, and this providing the necessary **links** of the various activities to support each other towards **effective** and **continuous** co-ordination/co-operation.

However, since goals are regarded as windows to the future, reflecting an outlook planning perspective, they should also link a sound understanding of the existing problems, related to land uses and resource use, to feasible opportunities for future movements in **sustainable development patterns** of the key planning and management issues. Accordingly, the **principal goal** of this document is to assist the whole process in cutting across sectoral boundaries and incorporating the interactions between the coastal natural resources and the socio-economic influences affecting the coastal environment.

Due to the need for **integration** – an issue which has been addressed from the beginning of the ICAM process – the **analysis of the coastal profile** has covered a great part of the preparation of the ICAM Planning Study in which **the identification of the main environmental problems**, the examination of the way that the **whole system of resources** of the project area is developed, and especially the land uses of the sensitive coastal environment, as well as the evaluation of the **limitations** (organisational, legal, traditional ways of behaving) involving in the system we are considering in this plan.

It's appropriate, however, to mention here the **main goals** of the ICAM Planning Study presented in a hierarchy way, in accordance with the complexity, cruciallity and priority of each one:

a) *Secure coastal **environmental protection** and in some cases improvements.*

b) *Achieve a **sustainable level** of coastal development and conservation.*

c) *Strike for **integration** of all possible human activities including multi-sectoral and cross-sectoral socio-economic integration, incorporating the vital **tribal system** into planning and management process, as well as other important factors influencing integration, like behavioural factors, local co-operative systems, etc.*

d) *Encourage a participatory approach for achieving greater levels of management efficiency and securing consensus amongst the actors involved in the decision making process.*

However, taking into account that both goals and objectives are close related and are indeed in the core of any planning process, it will be useful to mention here the specific tasks incorporating the **objectives** of the ICAM Planning Study:

- **Diversification of economic activities** by attracting new employment opportunities at the leisure and financial services sectors, tourist, agricultural, industrial, and fishing sectors as well as stimulating co-operative systems for grazing management.
- Encouragement of **mixed land uses**, and provision of close relation between land uses and transport (public transport in particular), such as trains, buses, as well as air and sea transport, etc.

- **Introducing energy conservation** policies and use of renewable energy sources (especially wind) not only for energy efficiency, but also to combat harmful pollution and preserve sensitive areas, as well as improve the broad relationship between land use planning, energy consumption, and housing objectives.
- **Stimulating population growth** in the region and provision for training people in the new development sectors of tourism, leisure, and agricultural activities.
- **Concentrating population and employment opportunities** among transport routes and in special suburban/rural centres.
- Initiating programmes for natural protected areas, and particularly coastal areas, but also archaeological sites, reserves, etc.
- Improving essential **public accessibility** to coastal seafront areas and to public spaces, and also landscaping the links between the different land uses and transport facilities. In particular scoping features, such as **tree planning** around development areas, affecting positively the micro-climate of the area by reducing wind speeds (regarded as one of the main problems), and thereby differentiating air temperatures.
- **Stimulating agricultural activities** (greenhouses, farmhouses) within and near housing and farm areas (villages, tribes), using underground water or sea water (through desalination process), which will be transported using renewable resources.
- In this way it is expected that not only degraded land can be recovered periodically from intensive utilisation (grazing and cropping), but also other undeveloped and could be developed similarly, in accordance with certain programmes.

Accordingly, the main tasks to achieve the above goals and objectives are:

- To identify the basic parameters of the present status of land use, planning and development policies in the Matrouh-Fuka area;
- To evaluate the possible trends of land uses and activities, and to determine the strengths, weaknesses and opportunities for future development, but also the possible threats for future actions for sustainable development in terms of possible conflicts of land uses, unsuitability of land uses, as well as consideration of possible future national, regional and local changes taking place in land use planning policies; and
- To present alternative directions of the future land use planning and development, setting up the basis for the preparation of the areas "frame" for sustainable land use planning as a policy guidance system, so that to safeguard the necessary sustainable development of the area's environmental resources.

Within this scope and parallel to the above general objectives greater responsiveness has been focused on specific needs of particular area, zones and sites to have **special attention** and **exclusive planning requirements** to respect local characteristics and environmental conditions of greater significance. This implies that it would be a possibility to introduce the necessary **carrying capacity threshold/limits**, the degree of environmental sensitivity, alternative schemes for redistribution of some of the existing land uses and activities, the nature and the volume of permissible new mix land uses, the degree of prohibition of certain land uses and activities, and also methods of safeguarding sustainable development of the whole coastal area in general, while special attention has been paid to the stimulation, and if possible, attraction of the national population from other congested regions of Egypt to move to this area.

3. METHODOLOGY

For the purpose of fulfilling successfully the main objectives set out by MAP/PAP, and accordingly, of contributing to the final product of the overall ICAM Planning Studying process, it was recognised that **three main streams of resources** should be examined and carefully analysed in advance:

- The existing **legal and institutional framework,** as well as the **responsible agencies** involving within the planning process regarding the land use planning policy;
- The available **planning tools and resources** (plans, research work, survey, programmes, development plans, national/regional guidelines, etc.) directly or indirectly related to the land use planning policy, as well as to other correlated aspects of the area's planning and development in general; and
- Overview of the **existing status of the land use planning and development,** the observed **trends, problems/obstructions** and the **perspectives/potentials** of the area under consideration.

Meanwhile, it should be mentioned here the fact that significant role in constructing the ICAM Planning Study has been played by the outcome of the preliminary reports concerning the land use planning and policy of the area, as well as the strategic Environmental Impact Assessment (El-Raey, 1999).

Using the above sources, reports, conclusions, data and information as a base, it is considered that the main goals and objectives at the ICAM Planning Studying process and plan could be, to some degree, achieved. For this purpose special attention has been focused on aspects related to the **present status of land use planning** and that of the **environment,** in an effort to determine not only the future of the area's development process, but also the necessary introduction of special actions and certain limits so that to reduce or eliminate negative impacts, and, in some cases, protect the area's sensitive coastal environmental resources (Fig. 3).

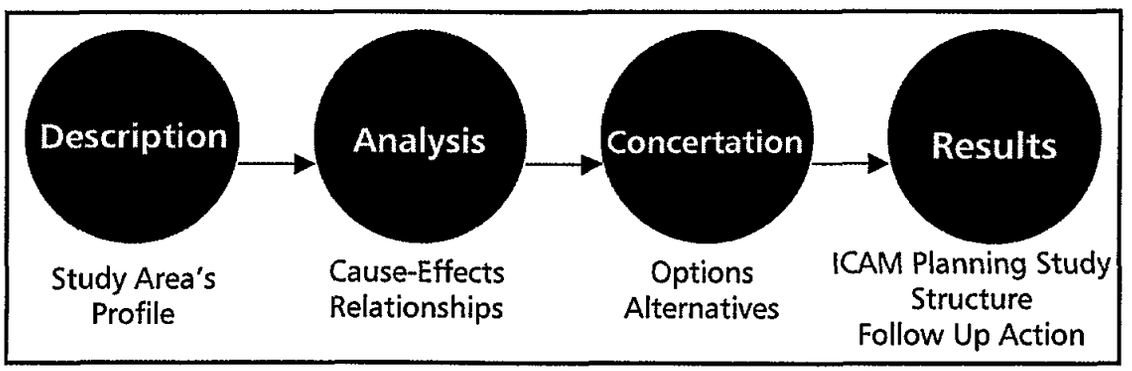

Figure 3: Schematic Content of the Mission Programme

Description	• Biophysical features and terrestrial ecosystems (Flora/Fauna) • Topographical and geomorphologic elements • Climatic and atmospheric conditions • Land ownership Land systems units • Population characteristics • Terrestrial land and marine ecosystems • Mainland use types – structure planning and development • Land resource, survey • Infrastructure • Protected areas
Analysis	• Cause-effects, relationships • Main causes of the existing environmental problems • Assessment of the possible impact of the main big project plans and programmes • Strategic evaluation of the development measures • Synthesis of available resources to permit concertation
Concertation	• Evaluation of available data, information, etc. • Evaluation of preliminary reports of the area • Discussion of available options • Co-ordination of the actions involved in the planning and management process • Formulation of plans and programmes, strategies or visions • Evaluation of the strategic environmental impact • Assessment of the plans and programmes
Results	• Monitoring of the application of existing plans and programmes • Analysis of the existing policy problems • Feedback process of the application of planning and management tools • Lessons for the existing insufficient actions and follow up new actions

Figure 4: Principal Tasks of the Mission Programme

Accordingly, the methodology has been constructed based on the following main steps:

a) **Determination of the ICAM goals and objectives based on previous work.**

b) **Presentation of the areas profile – main characteristics.**

c) **Evaluation of the available planning and policy materials in terms of credibility and scope of offer.**

d) **Analysis of the existing planning and management problems of the area, main trends and dynamics.**

e) **Presentation of the possible alternative development opportunities but also the limitations and certain threats.**

f) **Proposals for alternative strategic planning and management actions.**

g) **Evaluation of the strategic Environmental Impact Assessment of the propose actions.**

Methodologically, we should also mention some of the elements involved in the coastal areas we are examining. Firstly the **importance** of coastal zones and the **threats** that they face, must be introduced in a proper way together with a preliminary **definition of the coastal zone**, before any detailed introduction of such tools as carrying capacity of land development. Meanwhile we must agree that, theoretically, it may not be easy to define coastal sub-systems, since there is always a need to reconcile the contrasting perspectives of those involved in the process of management of coastal resources, hazards and activities (Parpairis, 1998).

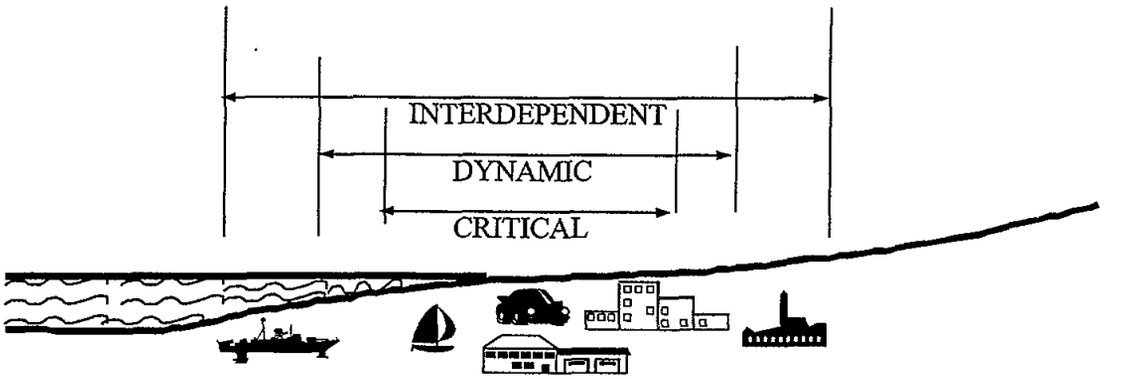

Figure 5: The System of Coastal Zones

However, in recent years many countries have recognised the importance of coastal zones and studied ways of incorporating coastal issues into their planning system. In certain cases the coastal zone is defined as a strip of **land** and **sea,** of varying width depending on the nature of the environment and management needs, while the **coastal system** combines **three (3) main characteristics.** These are inter-linked and produce the unique nature of a coastal zone: **land, sea** and **hazard zone** interactive and dynamic zones respectively, and the narrow hazard zone where they interact (Figs. 5, 6).

However, in certain coastal ecosystems, the need has been expressed to take into consideration a unique combination of **resources, constraints** and **opportunities** for development or use, since the nature and significance of these factors will depend on a combination of the **physical character,** the **natural heritage** and the **coastal use,** of present and past development, historic interest and technological hazards (HMSO, 1993).

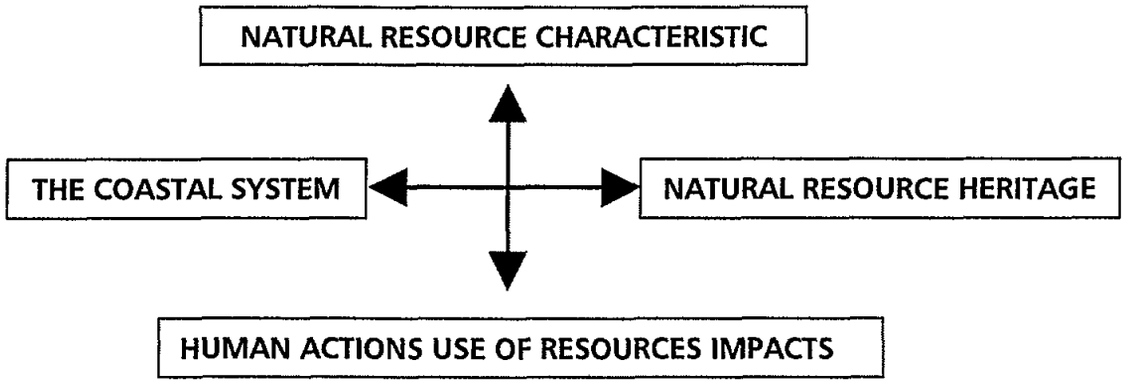

Figure 6: Elements of the Coastal Ecosystem

The coastal zone must also be viewed as a series of **inter-linked physical** systems, comprising both **offshore** and **onshore elements.** This **dynamic nature has important implications** for any kind of action and development in the coastal system elements. Accordingly, the significance of the coastal zone is now surpassing the local character and becomes an international issue. Firstly because of the **important role** these systems play from various aspects (ecological and economic value since they are among the most biologically productive ecosystems in the world), and secondly because of the **threats they face** (energy related development, coastal defence work, land reclamation, heavy industry, recreation and tourist activities, fish farming, etc., Coccossis & Parpairis, 1996). Consequently, a definition of a coastal sub-system incorporating the main elements and

their dynamic nature corresponding not necessarily to geographical, administrative or planning units could be:

> *"The natural coastal system and the neighbouring areas (land & sea) in which human activities involve the use of coastal resources and which may extend well beyond the limit of territorial waters, and many kilometres inland".*

Compared with other areas, the Mediterranean region has a relatively long coastline in relation to its land area. There is a wide variety of types of coastal zones, with different natural, economic and social conditions. The Mediterranean area is where human impact has been greatest, and where changes in the environment have also been monitored and studied longest (EEC, 1997). In the Mediterranean, **Egypt is regarded as one of the richest countries in terms of coastal ecosystems**, owing to its geographical location in the Mediterranean, its geology and climate, and above all its cultural heritage.

In addition to their biological and aesthetic value, the coasts and their ecosystems ensure important natural processes upon which man's productive activities are directly depended. The coastal dunes, for example, are a case in point, the significance of which has only recently been realised. These dunes are not only a habitat for numerous species of **flora** and **fauna**, but also protect the hinterland from the effects of sea and sand, and regulate the required equilibrium of salt and fresh water.

4. STUDY AREA PROFILE – MAIN CHARACTERISTICS

4.1. Biophysical Features and Terrestrial Ecosystems (Sea, Soil Hydrology, Water, Vegetation, Flora/Fauna)

In this chapter we are examining the **environmental characteristics** which affect directly the present and the future distribution of the human activities, and accordingly, the land use pattern and the physical landscape modification. Since the **environmental changes** are the result of both natural and human processes, it is important to present here the **main biophysical elements** as they are defined based on the present status and the nature of land use planning and policy of the project area.

4.1.1. Sea

Information on incidence and the levels of coastal pollution is scarce, since there is no continuous monitoring plan, and therefore, it is difficult to evaluate the situation. However, there is **no visible sewage pollution** or other kind of pollution resulting from off-shore oil exploration, shipping, shipbuilding, traffic and port facilities of the sea water except for the tar which comes from the ships that sail by. The colour of the sea is blue-green with no visible algae formation, and the transparency is high (El-Raey, 1995)

4.1.2. Soil

The project area's soil is regarded as young and essentially alluvial (Harga, 1967), with absence of diagnostic horizons. **This type of soil** is produced from **two main sources**: The **Mariut inland plateau**, composed of limestone alternating with strata of limestone and shale, and **Beach Deposits**, composed of calcareous Eolithic grains (Ayyad, 1995). Soils of the **coastal ridge and dunes** are loose or moderately consolidated calcareous grains of sand dimensions almost free from salts. On the **slopes**, the soils are pale brown and loamy in texture, while on **upper and middle parts** the soils are mixed with cobbles and gravel of various sizes throughout the profile. In contrast, in **lower parts** the surface is covered with relatively thick layers (2-5 m) of loamy soils washed down from higher levels. In **non-saline depressions** soils are highly variable, in some parts calcareous, while in other areas alluvial loamy soils dominate. Near the **seashore line** the soils may be mixed with lacustrine saline sand clays, and in **lagoonal salt marshes** the soils are very shallow profiles usually covered with thin salt crusts. **Transitional areas** between ridges and depressions are covered with layers of down-wash materials transported during the rainy season.

However, the **southern part of the coastal plain** is characterised by three main types of soil. One area is moderately affected by salts and pH values. The second type soil is covered by gypsum together with lime accumulations, while the third type includes soils with definite zones of lime accumulations at certain depths.

The **coastal plain soils**, in general, are well drained, except for some scattered parts which are poorly drained, and there are some saline soils which **are not suitable for agriculture**. The **tableland soils** are loamy and loamy sand, with alternating strata of limestone and shale with a medium to shallow profile in depth strongly affected by salt, while the **soils**

of the Wadis which intersect the tableland are composed of loamy deposits and **are suitable for cultivation**.

All the beaches are composed of white, loose carbonate sands, well polished and round, moving towards inland. The loose carbonate sand gradually change to fairly consolidate limestone forming ridges that skirt the coast. The ridges are of marine origin and represent bars and depressions which separate ridges form lagoons in which alluvial loam deposits are present, mixed with calcareous sand.

The depressions that are close to the shore are salt affected, i.e. unsuitable for cultivation. In winter, salt marsh conditions prevail in the low parts of these depressions. Generally, the soils of the beaches – that are affected by salt – are unsuitable for cultivation, unlike the soils in the wadis and around highways.

The coastline of this area is of sandy rocks covered by soft sand along the shore, with certain solid rock headlands and sandy beaches, smoothly sloping towards the sea, which gives a good opportunity for tourism development. The shoreline is characterised by the presence of a succession of bays, formed by rocky headlands. This rocky edged decrease to the south.

4.1.3. Natural Water Resources

Three possible sources of natural water are available in the area as the major source of needs for agriculture and drinking: **surface water** (rainfall and flood water), **ground water** and **water from other facilities**. However, the main source providing water for drinking and culinary purposes is the **Alexandria pipeline**, carrying the Nile water, which follows the coastline and ends at M. Matrouh supplementing the Matrouh desalination units. It provides M. Matrouh with about 10,000 m^3/day of drinking water, and is connected to hotels, some houses and public buildings. Due to increased demand, works to enlarge the above pipeline are under way.

The **surface run off**, due to the homogeneous morphological formation of the project area, favours the accumulation of large water quantities in the **natural drainage channels** (wadis). The existence of elongated ridges prevents run off water from escaping to the sea. **Dykes** have been constructed over the catchment area of wadis in order to conserve water. In the vicinity of M. Matrouh and Fuka there are 22 and 19 dykes respectively (Dragicevic, 1993). They can store 74,000 m^3 of water in M. Matrouh and 69,000 m^3 in Fuka. The water collected behind the dykes is used mainly for irrigation.

Other water sources in the project area are the **cisterns** where the rainfall is collected. This type of water is mainly used for irrigation of orchards and in rural areas for drinking. **The ground water** source is mainly developed in the **Nobian sandstone reservoir** with an area of 2.5 million km^2. It extends from the south-east of Egypt to the north-west, i.e. to the north Qattara depression. In the Fuka region there is also a trapped ground water reservoir from which the water is extracted through **hand dug** or **drilled wells** and used for irrigation of orchards. There are also **shallow wells** along the coastal strip, which are subject to saline intrusion.

In general, the underground water is found at the sediment layers (in the study area). Water generated by shallow wells is limited in quantity. It is of low quality due to its presence in thin layers with low coefficients of permeability and dependence on seasonal rainfall. Underground water can also be found in the limestone layers available under the Fuka basin. It can produce water at a rate of 20 m^3/hour for some wells, with an average quality, which gives approximately 2 million m^3/year, of which only 72,000 m^3/year are

used which shows the great importance of the groundwater for the entire basin (El-Raey, 1999).

The amount of rainfall in the project area is approximately 140 mm/yr. Most of the rainfall occurs in winter with maximum in December (in Marsa Matrouh 38.7 mm) and January. Summer seasons are virtually dry.

4.1.4. Vegetation

As it became obvious from the above description, the quality of the area's soils and, accordingly, the **production is rather low** and the **irrigation water is insufficient**. Dense cultivation and pastures can only be found within 25m wide coastal belts. Further inland, only in scattered areas pastures are found and **agriculture's practised**. Figs, almonds and olive trees grow mainly in the coastal plain, while in depressions, where irrigation is possible due to rainfall, wells and cisterns develop.

However farmers prefer olive trees because they are available on the market and tolerant to drought and salinity. The region of study area has a heavy flora that begins at the coastal area and extends to the rocky plateau (El-Raey, 1999). There are two kinds of flora in this area:

- The first kind: plots planted with olive, palm tree, and wheat depending on rainfall and wells that are randomly distributed.
- The second kind: plots with coastal plants and herbs.

Meanwhile, in the **coastal plain and wadis where barely and wheat are cultivated**, the grain production varies from year to year following the high variability of the rainfall. We can estimate that the average grain production ranges from 200-300 kg/feddan (1ha = 2.38 feddans). The **cultivable land** in M. Matrouh covers 86,543 feddans, and in Dabba 24,291 feddans.

The composition of plant growth forms in the region is a typical **desert flora**. The majority of species are either annuals (ephemerals) or geophytes (perennial ephermeroid herbs and grasses).

The phenomenon of succulence is common to the vegetation of saline depressions. It is considered to be one of the mechanisms which enables plants to overcome the problem of "physiological dryness" caused by high osmotic pressures of the root environment.

Five major types of habitat are recognised in this region: **coastal sand dunes, inland ridges, non-saline depressions, wadis, and inland plateau**. Each of these habitats is characterised by the local physiographic variations, which effectuate variations in vegetation composition and species abundance. **Eight main physiographic categories of coastal dunes are recognised** (Ayyad, 1973):

- Very active baby dunes, lying close to the shore.
- Active, partly stabilised dunes.
- Protected leeward slopes of active large dunes.
- Stabilised dunes with typical dune form.
- Deep protected sand shadows.
- Exposed barren rock and escarpment of the coastal ridge.
- Sand sheets overlying saline flats.
- Shallow protected sand shadows (occurring only in the eastern province).

4.1.5. Fauna

The **fauna** of the north-west Mediterranean land may be categorised within 3 well-defined **physiographic zones: the coastal sand dunes,** from the sea shore to the Mariut salt marsh depression, the **salt marsh depression** between the 2nd and 3rd ridges, and the **inland non-saline depressions.**

The first zone has an attenuated Xero-Mediterranean climate while the third zone has an accentuated Xero-Mediterranean climate, and this difference, together with the first salt marsh depression acting as a barrier, has its influence on the **fauna inhabiting the first and third zones.** They are remarkably **different** from each other **in species, population density,** as well as **physiological behaviour and life.**

Because the **coastal dunes** have a more humid environment and their soils are more friable, as well as having denser vegetation, they have a **richer fauna** than the zone of the inland non-saline depressions.

Distribution of animals in these dunes depends on **two main factors: the soil salinity** due to salt spray from the sea and the **position on the dune**, whether facing the sea, on the dune crest, or facing the land, where the dune is more consolidated and stabilised with higher content of fine soil material and organic matter.

Rock **crevices also provide a particular biotope to fauna** associated with the roots of chasmophytes. In most cases, animals are confined to shrub canopies where they are protected from wind and radiation, and where food from accumulated plant litter is available. Richness of fauna is greater on the leeward side of the canopies, i.e., the SE side. This difference is greater under shrubs with V-shaped branching rather than with a cushion-like form. The characteristic species of this biotype are more varied than in the inland depression. It is remarkable, however, that the land snails, which are abundant in the inland non-saline depressions, are absent from the coastal dunes. **The fauna of the dunes** also shows a marked seasonal differentiation.

The fauna of the second, salt marshes zone has not been adequately studied, while the inland non-saline depressions third zone has. The greater diversity at the leeward side of shrubs is also observed. The sand roach populations are of lower densities than on the coastal dunes and have a more extended life cycle, but can benefit more fully from small increases in soil moisture than on the coastal dunes. One of the noteworthy phenomena is that population irruption's of some species may occur unexpectedly and unpredictably. During the seventies three such irruption's occurred, one in the **butterfly** ***Vanessa***, another in a bug, and a third in ticks. Up till now, no ecological theory or model can predict such irruption's which apparently can happen at any time and with any species (Ayyad, 1995).

Agro-ecosystems of the region are of two types: the older, rain-fed, and the more recent, irrigated. Each of these two types can be either sub-type of field crops or sub-type of tree crops. The four sub-types have different characteristic population of fauna, but remarkable thing is that micro-herbivores (potential pests) increase at the expense of both detrititivores and carnivores. This is due not only to better environmental conditions (more sources of plant living biomass) but also to its better quality, as well as the food sources provided by the proliferation of accompanying weeds. Together with this is the removal of grazing animals from the agro-ecosystems except after harvest of barley in rain-fed farms, or in neglected olive orchards (Ayyad, 1995).

4.2. Topographical and Geomorphological Elements (Geology, Bathymetry and Morphological Elements)

Using remote sensing and field observation, the geology of the study area was found to be simple. The area is covered by sedimentary rocks that vary from limestone to limesandstone and marl (El-Raey, 1999).

The rocks belong to the Miocene, Pliocene and Pleistocene ages. The topography of the area presents unique features. The area contains different elevated hills varying from 5m to 90m above the sea level.

The project area belongs to he western coastal region of Egypt, which is extended south for an average distance of about 50 km. In this greater coastal region we can distinguish physiologically two provinces: an **eastern province** between Alexandria and Ras El-Hekma, and a **western province** between Ras El-Hekma and El-Salloum (Ayyad, 1993). The landscape can also be divided into a **northern coastal** plateau and a **southern plateau** (tableland). In the eastern physiographic province a number of alternating ridges (bars) and depressions (lagoons) running parallel to the coast in the E-W direction. The ridges are formed of limestone with a hard-crystallised crust, and vary in altitude and lithological features according to age.

The topography of the area is characterised by three features: **coastline** (presence of long stretches of sandy beaches divided by a number of capes), **coastal plain** (3-8 km width), and **south plateau** Tableland (presence of Wadis – natural drainage channels).

Like most places in the north-western coast of Egypt, M. Matrouh – Fuka area is covered mostly by sedimentary rocks, which belong to the Quaternary and Tertiary periods, and long stretches and sandy beaches.

4.3. Climatic and Atmospheric Conditions (Rain, Temperature, Wind, Atmosphere, etc.)

The project area, has a semi-arid Mediterranean **climate** characterised by brief, mild, rainy winter and a long, warm summer (From May to September there is clear sky, high radiation and no rain. The situation changes in October when a windy and relatively rainy winter begins). The whole north-western coastal region of Egypt, according to UNESCO classification (1977), has summer's warmest month with a mean temperature of less than 30°C and winter's coldest month with a mean temperature above 10°C. The temperature regime varies from one location to the other according to the relative proximity to the sea and elevation above the sea level.

The mean annual **rainfall** ranges from 120 mm/yr to 155 mm/yr from Fuka to M. Matrouh. Most of the rain (60% or more) occurs during winter (November to February) and the summer is virtually dry.

Climatic conditions in the examining coastal region area in some seasons favourable for water vapour condensation (dewfalls, due to considerable temperature gradients between different soil strata and overlying air, high relative humidity, and still wind, particularly during summer and autumn. Mighaid and Ayyad (1995) estimated the gain in moisture content due to water vapour condensation on the sand dunes as ranging between 2.35% and 4.7%. The monthly mean **humidity** is higher in summer than in winter. In M. Matrouh during July it is around 73% and in August it reaches 71%.

Wind is generally light – since the wind speed doesn't exceeds 10 m/sec, over almost 95% of the year – but violent dust storms and sand pillars are not rare. The direction of the

prevailing winds is from the north-west with percentage of 21%. However, the area is subjected to the Khamasien **hot storms** during the spring months, which blow from the south-east. At the city of M. Matrouh wind blows strongly during winter and early spring, with and average velocity of about 20 to 23 km/hr; the end of summer is characterised by very calm days and the average wind speed drops to 15 km/hr.

Although strong wind occurrences only form a small part of the total, they have to be regarded because of their ability to mobilise and transport soil material. This is an important factor for the **land use** planning of the area. However, strong winds, with or without blown sands, have detrimental effects on **crops** and **yields**. They have a maximum in the NW sectors. A secondary maximum in the SW sectors is very pronounced. There are almost no strong winds from any easterly sector. The fierce sand laden SW winds account for sheets of siliceous sands.

Particularly silt, clay and organic matter, which account for fertility, significantly are subject to deflation. The worst effect is that once they are mobilised they hardly settle down. The resulting fertility erosion can only be detected and monitored with laboratory soil analysis. Flooding of vast areas of the tableland accounts considerable due to exposing soils to wind erosion by reducing of the **natural plant cover and destruction of soil aggregates (LUPEM, 1993).**

The increase of surface roughness reduces wind speeds at the surface and thus slows down the movement of soil material. Natural windbreaks are an appropriate means to reduce wind speeds in agricultural areas. They can consist of trees, shrubs or even strips of annuals or a combination of those planted in parallel rows. The exact design depends on water supply for the windbreak plantations and specific protection requirements.

The frequency distributions have shown that there is no need for windbreaks in any easterly wind sector (15 – 165 degrees), but in NW and SW directions. Orchards, which are located in sand sheet areas, require particular protection from south-westerly storms. It should be mentioned that an assessment and evaluation, like this one, gives important information for the establishment of wind driven devices, and provide essential information regarding whether **wind energy** can be efficiently utilised. However, in order to be able to decide whether or not **wind energy is a considerable resource**, frequency and force of average wind speeds, as well as frequency of strong and low wind events have to be known.

Prevailing wind directions govern the movement and circulation of seawater masses. According to the frequency distribution of wind directions the sea currents are presumably driven towards easterly or ESE directions. Whatsoever, direction and force of the currents have implications on the change of the coast.

There is a little difference in **sunshine duration** from place to place along the western Mediterranean coast of Egypt with a monthly mean duration of sunshine that ranges between 201 hr in January and 272 in August (Ayyad, 1995).

The average humidity is between 61.3% and 75.6% throughout the year. The most suitable time for sea-side tourism is summer starting from June till the end of October when the maximum and minimum average temperatures are around 27°C and 21°C, respectively.

4.4. Land Ownership, Land Systems Units

An important characteristic of the Population of the Matrouh Governorate, is that most are **Bedouin of Awlad Ajj tribes**, except those in the Siwa oasis (El-Miniawy, 1992).

These **tribes** are divided into two main groups: **El-Saadyeen** and **El-Morabiteen**. The first group occupies most of the land suitable for cultivation, development and tourism mainly land close to urban centres. The land utilised by each tribe takes the form of a band perpendicular to the Mediterranean, which gives the chance for each tribe to make use of a greater variety of productions from north to south. The relationships among tribes are very intimate and are practised in an unofficial manner throughout the whole area under consideration, managing in this unofficial way the region's economy. Each tribe is organised into a number of **"ailas"** (families), which, in turn are associated with a certain geographic location considered as a **homeland** (watan) and **corporate unit** if ever, utilises this land. The land is normally divided among the various **"bait"** (homes) constituting the aila. This land is sometimes also divided into several **"hosh"** (fields) in very different places (Ayyad, 1995).

When the land of bait or a hosh is undivided, each of its members can, theoretically, cultivate or graze any part of it, and becomes a **communal possession** or **corporate unit**. However, this is usually not orchards or cultivated land. Members of other tribal segments are allowed to graze their flocks wherever grazing lands are available, but they are not allowed to use the wells and cisterns. While **animals** are always in individual property, **water** for the flocks belongs to the bait owning the cistern and they can sold it to outsiders for animals and agriculture, but drinking water is given free to anyone in need of it.

Before 1985, the Bedouin were granted the right by the Egyptian Government to use the land of the Matrouh Governorate for grazing and cultivation. But **legally, the land belonged to the state** while in the previous period Ownership rights were based on tribal customs and law. With regard to grazing land, no legislation has been issued to date.

However, Bedouins often have doubts about the way the Government will deal with the land tenure system in the area. There is an increasing worry that land will be taken in one way or another for development projects that have nothing to do with them. Therefore, it becomes necessary to produce tenure legislation in a way that conforms with the development programs, and to actively involve people in these programs, and to secure confidence between parties.

4.5. Population Characteristics

The **total population** of the Matrouh Governorate was 91,142 in 1960, 169,000 in 1986, 179,344 in 1993, and the preliminary results of the 1996 census show that the population increased further and approached the level of 211,966 inhabitants (Fig. 7). This gives a population density of about one person per km^2. Marsa Matrouh City and the surrounding area have the biggest concentration of population accounting for about 40% of the total, while El Alamein has only 1,841 inhabitants. 52% of the total sum are males; 68% live in urbanised areas. Birth rate is still very high in the Governorate (3 to 4%) although the newly established family planning units have in the last three years reduced the number of newly born. There is **two different social groups in the population** of the NWG: **the Bedouin** and **the immigrants** who have migrated from the Nile valley.

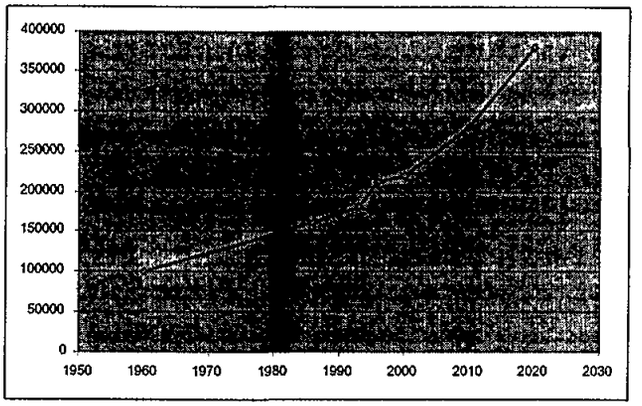

Figure 7: Matrouh Governorate Population Evolution (1960-2020).

The population is not evenly distributed in the region. 48% of the population live in the zone close to the coast (<5% of the total surface), 41% in the middle zone (nearly 5-15 km inland), and 11% in the innermost zone (>15% of the total surface). The average **population density is 55 persons/km²** in the third zone (Fig. 8).

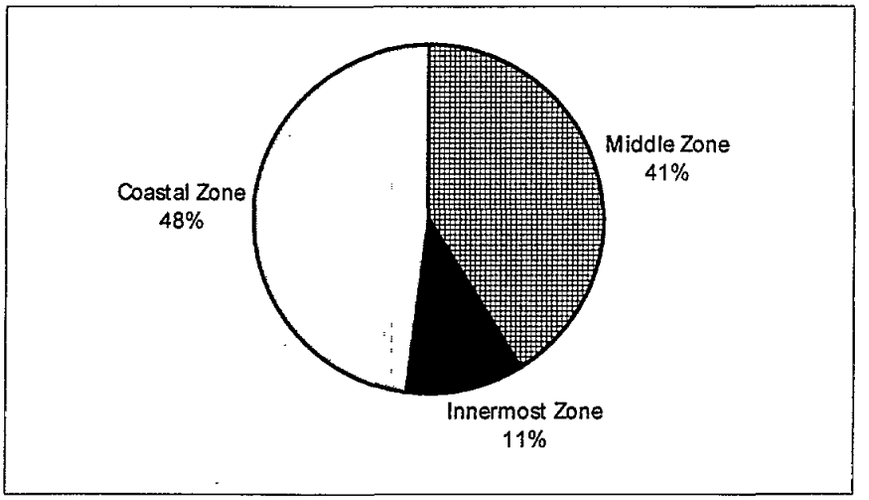

Figure 8: Population Distribution in Three Zones

As for urban/rural distribution, 53% were living in urban areas, and the rest in rural areas. It should be mentioned that this distribution is almost similar to that of Egypt as a whole. About 86% of inhabitants is Bedouin(El-Raey, et. al, 1997).

However, less than 1% of the population have a **university degree** 11% have a secondary school degree; more than 50% of the total population are illiterate, but education has recently received an impressive attention. About 36,000 pupils attend primary and secondary schools. In the project area, all public functions are concentrated in the M. Matrouh City.

There are two different **social groups** in the population of the NWG region of Egypt: the **Bedouin** and the **immigrants** who have migrated from the **Nile Valley**. The Bedouin tend to settle in the desert, whereas the immigrants settle in towns, with separate patterns of life, at different levels of organisation. The Bedouin are employed in livestock production and commerce and look to the Omdas or mayors (head of tribe) and Sheikhs (deputy

Omda) for leadership. The immigrants are employed in government services and construction and took to the national Government in Cairo for leadership.

Illiteracy among children and young men is high (70% between 6 and 30 years of age). There is no vocational **training** available in the region. The illiteracy is notably higher among women. According to El-Naggar *et al.* (1980) few schools exist in the region (e.g. in 1985, 67 regular primary schools, 15 preparatory schools, and 11 secondary schools in the areas of Matrouh, Barrani and El-Salloum). **Two schools for technical education** provide training in the town of Marsa Matrouh in the fields of industry, commerce, agriculture, teaching and nursing (but not for tourism!!). Recently (1992), a faculty of Education, affiliated with the University of Alexandria, was established in Marsa Matrouh to supply the region with school teachers.

However, according to a **labour and employment Analyst** (El-Raey, 1995), eighty percent of the Bedouin are engaged in sheep and goat herding and the cultivation of barley, vegetables and trees. About 15% depend on commerce as a source of income and the remaining 5% work for the government or private employers. Most males work in traditional agriculture and animal husbandry. Commerce, meanwhile, engages a small percentage of the male labour force. Some Bedouin work for the Egyptian Government as teachers, drivers, mechanics, clerks, and guards. Bedouin also work in quarrying and construction, but mostly as guards.

About 40% of the farmers allocate family labour for domestic tasks and non-production labour. This allocation includes tasks which are primarily performed by females: preparation of food, the care of family clothing, and handicraft production. There is an overlapping of labour roles for males and females in the harvesting of barley, fig and olive, as well as work with animals in need of special care.

We may conclude from the previous analysis of the human resources that the population of the NWG region has certain characteristics that could be summarised as follows (Ayyad, 1995):

- **High percentage of population under 15 years, and low percentage of working population in the productive age, compared with the national standards.**
- **Low educational standards, and high illiteracy, which reached 75% of the population**
- **Neither the number of the population, nor the educational or training conditions, can offer satisfactory economic base considering the vast acreage of the region, a matter that leads to possible in-migration to the region with application of development programs.**
- **Despite the fact of the small size of the population, it should be necessary to depend on local skills in traditional agriculture and husbandry grazing, in trade and commerce. Their long acquired experience will enable them to play an important role in developing and financing different projects.**

Women are occupied in the tasks of children and family, household chores, tent repair, weaving, and the herding of sheep near home. Work outside the home for females is still considered as improper.

Tribal borders are one of the best-known and documented facts in Matrouh. They are given considerable importance in the development plan because they represent the clearest planning units; and because in this area boundaries of villages and districts, which

divide planning for a region of this size into manageable units, are incomplete and/or uncertainly defined.

While tribal borders are clearly defined, the location and size of settlements within these boundaries is uncertain. Part of this problem is due to the mobility of Bedouins, particularly within tribal boundaries. Especially where a tribe has land in several zones, cultivate barley on the north plateau and graze their flocks on the south plateau. Even families with land limited to a single zone may rent holdings elsewhere for the cultivation of barley and may send their flocks with hired herdsmen to distant areas for grazing.

4.6. Terrestrial Land and Marine Ecosystems, Coastal Ecosystems

4.6.1. The Terrestrial Ecosystem of M. Matrouh-Fuka Area

The terrestrial ecosystem of M. Matrouh-Fuka area are as follows:

- The rocky crest of Ras El Hekma and the area of Sallum in the leeward side of the Libyan plateau protect the area of Fuka from the rainy winds, while each receives less water than the rest of the coastal region.
- According to local information, the **wadis east of Matrouh** carry less water than the **wadis west of Matrouh** (El Qasr). This is probably due to the more permeable soils of their catchment area, while the **wadis of Baggush** carry less water than other wadis in the coastal region. This is due to the lower rainfall of the area.

The maximum discharge of the designed hydraulic works for the wadis of the coastal region must be known. Discharge measurements in some wadis are very few and it was possible, in the reinvestment project, to apply a formula for calculating maximum expected depth of precipitation's during the "time of concentration". The physiographic characteristics of wadis (size and length of catchment areas, average slope) can be determined with certain accuracy from the existing maps and aerial photos (Ayyad, 1995).

According to the physiographic variations, **two main sets of habitats** may be distinguished in the area under consideration, one is **ridges** and **plateaux**, and the other in **depressions** (Ayyad et al, 1986a). Ridge and plateau habitats may be further differentiated into **two main types: (i) the coastal ridge**, which is composed mainly of snow white calcareous grains and which is overlain by dunes in most of its parts, and **(ii) the inland**, less calcareous ridges, and the **southern tableland**.

However, **seven main habitats may be recognised:** (1) coastal calcareous dunes, (2) non-saline depressions, (3) saline and marshy depressions, (4) ridges and rocky elevations, (5) inland plateau, (6) wadis, (7) inland siliceous deposits. Each of these habitats is characterised by local **variations in physiography** which results in the formation of a mosaic of microaites with local variations in vegetation composition.

The majority of species are therophytes (40,8%) and chamaephytes (93.4%). Accordingly, **species diversity** may be assessed by several indices. The simplest index is merely the number of species in a community (or habitat) at a site, or in a region, and is called **"species richness"**. As for species richness, the western Mediterranean desert (in which Fuka-Matrouh area is located) is, floristically, one of the richest of all phytogeographical regions of Egypt. The most striking observation is that the highest richness is recorded on ridges and inland dunes: both habitats are characterised by strong heterogeneity of microsites. It is also notable that species richness is lower in man-made habitats than in natural habitats. Because genetic diversity (intraspecies variations) of wild species in Egypt is little explored, more intensive studies of this type are needed to provide information

about the genetic diversity of species which exhibit morphological variations in a variety of habitats.

4.6.2. The Marine Ecosystem

According to Beltagy (1993), the area of Fuka-Matrouh is rich in many marine living organisms. But it is obvious that, despite the richness in species composition, the numbers are somewhat limited. These species are endangered because of pollution and urbanisation activities. It has to be mentioned that a disaster occurred in sponge fisheries in 1988, and these fisheries are still suffering from its results.

There is lack in the information about the other organisms, which leads to specific conclusion. This may be due to the fact that this area was carefully studied for only one time so it is difficult to make any comparisons.

A description of the current conditions of the marine ecosystem of Fuka Matrouh area has been present by Jeftic et al, 1995.

The comparatively flat portion of the **beach profile** extends seaward. The **offshore zone** may extend about 10 km from the shore and depends on its slope. The nearshore and beach face slopes are relatively steep, but the slope becomes flatter in the offshore zone. At the western coast, the beach face and offshore slopes are found to be 1:3-1:10 and 1:20-1:90 respectively. The bathymetry of Fuka-Matrouh area indicates that the offshore slope in front of Ras El-Hekma is steeper than that around Ras Alam El-Rum. Comparison of the different surveys shows that erosion is starting to act in deep water and then approaching the shoreline. Such type of erosion may be due to temporary seasonal conditions.

The height and direction of the **waves** are affected by refraction, dissipation of energy and breaking during their propagation into shallow water near the coast. The effect depends on the local bathymetry, which may allow only a limited window of directions to reach a certain location. The directional distribution of the wave energy along the coast generally leads to a clockwise rotation of the dominant local wave direction. This causes a resultant eastward longshore direction of the wave energy along the coasts.

Available data record that the predominant waves are approaching from N. W. sector. The following summarises the wave characteristics:

- Maximum wave height: 250 cm
- Average wave height: 74 cm
- Average wave period: 6.8 sec.

Littoral currents play an effective role in sediment transport along the coast. The gradient current is dominating the surface circulation along the north-western coast and not the drift. Computed velocity values of the total surface current in front of Fuka-Matrouh coast range between 11-15 cm/sec, and feeding eastward. Bottom current values decrease noticeably down to 100m depth to be 3-5 cm/sec, and feeding westward (Fig. 2). Rip current usually occurs along many coasts of the western region. The effect of **tide variations** is felt in delineating the shoreline as well as the **wave characteristics**, and the breaking point, while determining the current and bar formation. Tide influences, to a limited extent, the sediment movement along the coast by shifting the level of attack of wave action and by governing the flaws in lagoons.

During winter, at both Fuka and Matrouh the intrusion of a **water mass** with relatively lower salinity (39%) and temperature (18°C) moving coastward was observed. This water

mass was balanced by a flow of water of higher salinity and temperature moving seaward. During spring, while a weak stratification in both temperature and salinity was observed in Fuka, the coastal water in Matrouh was still relatively homothermal. In both summer and autumn seasons, a distinct seasonal thermocline was observed in both Fuka and Matrouh.

The **oxygen content of the surface seawater** in Matrouh showed a high value during winter and decreased during spring and summer through autumn. In general, the eastern Mediterranean is considered of the oligotrophic areas poor in nutrient salts, which are necessary for phytoplankton growth and flourishment. The area of Fuka-Matrouh is one of the most oligotrophic areas of the eastern Mediterranean. The **phytoplankton** standing crop in Matrouh was slightly higher than in Fuka. The population increased towards offshore of Matrouh and vice-versa occurred in Fuka. While the least population density of zooplankton was recorded during winter season in both Fuka and Matrouh, autumn and summer were the flourishing season respectively. Spring and summer were the flourishing seasons of benthic flora.

However, the highest population densities of the **bottom fauna** were recorded during spring and summer in both the inshore and offshore of Fuka, during winter and summer in the inshore of Matrouh, and during spring in the offshore of Matrouh. The sponges are representing in the area by eleven species, five of which are commercial. There are **three species of marine turtles** known from the Egyptian Mediterranean Sea, but all tracks of emerging nesting turtles around the area Fuka-Matrouh were identified as tracks of the Loggerheads Turtle "Carreta-Caretta".

Although all the marine turtles are listed as endangered throughout their range, the official statistics show the increase of the Egyptian turtle landing to 418 in 1990. The study area does not provide suitable habitats for Monk seal.

There is a lack in information about other organisms which leads to a specific conclusion. This may be due to the fact that this area was carefully studied only once so it is difficult to make any comparisons.

5. STRUCTURE PLAN – EXISTING SITUATION

The outline of the existing situation of the structural plan of the area under discussion must be seen as a supporting tool to identify the spatial unbalances, the land use conflicts, and of the natural characteristics to be protected in order to safeguard the sustainable use of available resources, and above all, to provide a clearer picture of the existing difficulties in order to enable safer future development planning (Map 6).

5.1. Main Land Use Types, Structure Planning, and Development

Some prominent factors (geographic, topographic, climate, soil) have been already mentioned are affected by the current distribution of the **main Land Uses Pattern**, as well as that of the spatial distribution of urban areas and rural settlements. The existing resources of land, water, and the main connection lines (like the coastal road and the parallel railway line) have greatly affected the land use types of the area, as well as their current sizes and locations.

The main land use types of the area under consideration could be grouped in the following way:

- Agriculture;
- Tourism/leisure/summer holiday;
- Settlements (urban, rural) ;
- Industry/agro-industry and commerce;
- Infrastructure and Services;
- Coastal areas without any use; and
- Undeveloped areas;

However due to the lack of essential (size, quality, etc) fertile land, water, and adequate technologies of use, this area will, no doubt, continue to search for new **methods** and **means** for efficient and sustainable land use distribution and economic development opportunities.

The region is characterised by a definite pattern of **spatial variation showing unorganised land use profile**, and consequently, **the distribution of income** depending on the land nature of the region in combination with variability of climate and physiographic features.

However, the land use planning, as it is happening in most cases in Egypt and elsewhere, is carried out at both regional and local levels could be regarded as insufficient, since it is defining basic land use patterns rather than balancing social, market and environmental values.

5.2. Survey of Economic Activities

5.2.1. Agricultural Sector

In general, **agricultural activity** has been for a long time the main source of income in the north-western coastal region of Egypt, and has become the principal source although the role of other activities (like tourism) is increasing continuously.

According to governmental estimation of the agriculture state in Fuka-Matrouh area (IDSC, 1993) the land used for agriculture covers about 86,543 Feddan, the main crops being wheat and barley. The main problem that faces agriculture is water. Local farmers depend on rainfall, so, crops productivity varies according to rainfall. For purpose of **agricultural classification**, the area can be defined in three (3) production zones (El-Naggar, 1988):

a) **Coastal cultivation strip**: This strip extends from the seashore 5 to 10 km inland, including the beach and the coastal plain. Annual rainfall is about 150 mm. Cultivation of orchards and vegetables predominates, especially in deltas of wadis. The inhabitants are settled. It constitutes 5% of the total land.

b) **Inland mixed production grazing/cropping (barley) strip**: South of the coastal strip, between 5-15 km from the coast. Annual rainfall is 100-140 mm. Soils are poorer. Grazing (especially sheep and goats) and cropping are the main activities. Inhabitants are sedentary. It constitutes 22% of total land.

c) **Inland grazing (range-land) strip**: This strip lies between 15 and 50 km from the sea shore. Annual rainfall is from 50-100 mm. Grazing predominates, with some cropping. It constitutes 73% of total land.

The land used for fruit trees is expanding rapidly at the expense of good **barley land**, while barley cultivation is expanding at the expense of the areas of range-land, which is less suitable for barley. Olive trees are often planted in marginal areas, where no other crops can be grown, but this activity is considered less attractive economically. However, figures regarding the land cover unit and classification of the above agricultural activities are not still available.

Animal husbandry, particularly breeding of small ruminants, has become important activity since the 60's, when the Bedouins earned enough money, through trade with Libya, to buy pickup trucks. The activity is traditionally the major and most prestigious economic activity of the Bedouin in Matrouh Governorate, since 30-80% of their income is earned through this economic sector.

According to El-Miniawy, et al, (1992) estimation, 90% of all agricultural activities are sheep breeding, barley growing and olive production. Grazing is the main activity for Bedouin. In 1992, the flocks/herds are estimated at (IDSC,1993):

- 555,300 sheep;
- 31,373 goats;
- 8 thousand camels.

This is in addition to some cattle and donkey breeding. The value of investment in grazing is estimated at 37.5 million Egyptian pounds.

In contrast, **fisheries** are a minor activity in this region, since Bedouins have a distinct preference for meat over fish, while the remaining population is mostly marine-minded. This is probably the reason why ship-servicing facilities are still very limited in the area.

5.2.2. Industrial Sector – Handicrafts and Agro-Industry

From the available data and information, in the Governorate of Matrouh there is not any legal industrial zone or important industrial site. An exception to the above would be some spontaneous agro-processing activity – mainly oil milling, from olives, and making carpets, units which are classified as artisan shops (cottage industries), and home based traditional handcrafts units, rather than small scale industries.

According to KACO (1978) report, the industrial activity in this region was restricted only to two gypsum factories which manufactured plaster, while the existing petrochemical complex (Ayyad, 1995) nearby provides a very good prospect and an excellent basis for combined production industries, since the availability of new materials, such as salt, limestone and gypsum, in the region could be regarded as most important.

According to the same source, the number of possible downstream operations based on organic and inorganic chemical complexes is very large, while the future products will depend on the marketing opportunities and the available technical knowledge parameters, which are changing rapidly.

It is possible, however, to mention that women of the region mainly undertake handicrafts and agro-products. To a large extent they depend on agricultural and animal raw materials. The most important of these activities are (Zoghby, 1990):

- producing carpets, blankets and tents, spinning wool, leather curing, embroidery and sewing;
- picking olives, drying peppermint, and producing olive oil;
- Breeding poultry and rabbits.

So, due to the fact that data on the present state of industrial land use are still not available, in terms of scale, character and intensity, any constructive comments on the future of this sector are impossible in this phase.

5.2.3. Trade

In earlier times, the Bedouins monopolised trade and transport. While the form of transport has changed from caravans to pickups, and trade includes new items such as land; the role of Bedouins in this economy is still strong, formally and informally, especially in animal trading. The transportation network is depicted in Figure 5 of El Ray, 1999 (final report).

5.2.4. Tourism/Recreation Sector

Local tourists (90% of the tourists received by Marsa Matrouh) arrive to the area by railroad or by the main highway. International tourists arrive by flights via Alexandria or Cairo. If the area is to be developed for international tourism, technical conditions of Matrouh airport ought to be improved. Overall tourism trends in the project area can be summarised as follows: about 85% can be defined as the sun-and-beach tourism, cultural, health and recreation tourism 10% (mainly concentrated in Siwa), and 5% for business and transit tourism (mainly in the city of Marsa Matrouh).

The tourism sector is one of the leading economy sectors in Egypt and particularly in the project area. The investment in tourism, in terms of bed capacity, is estimated to reach the number of 21,000 by the year 2010. This is an indication that tourism as economic activity, represents a significant part of the land use, mainly of the coastline recreational zone, and consequently of the whole Matrouh Governorate.

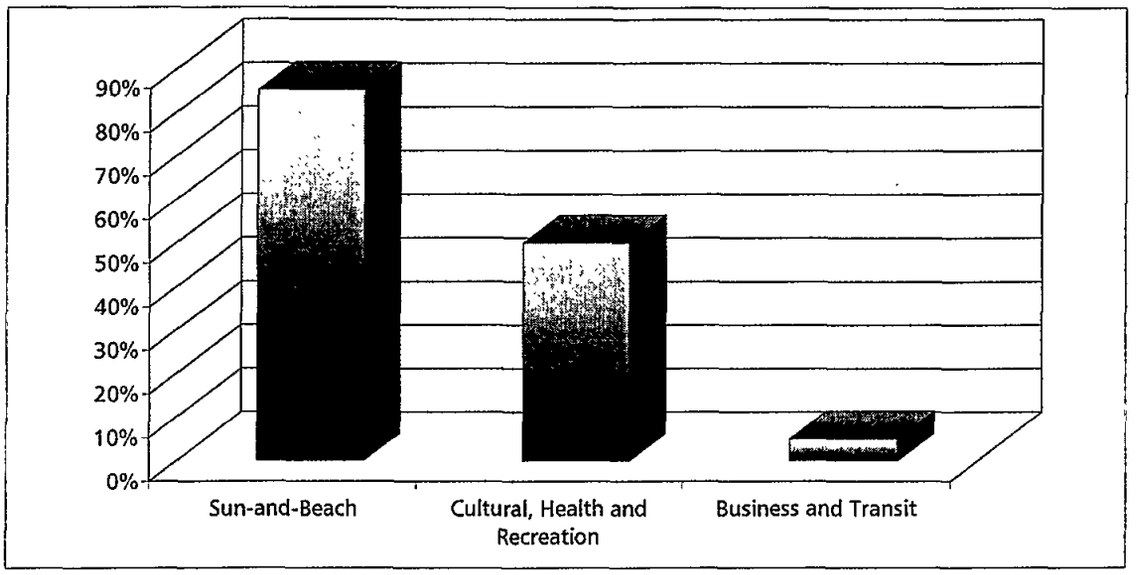

Figure 9: Distribution of Tourist Types in the Project Area

According to El-Miniawy et al, (1992) report, the total investments of the sectored development plan by year 2010, gives 37.3% to the sector of tourism, which is the highest proportion, with agriculture and grazing in the second position (Fig. 2). Additionally, in the Five-Year-Plan budget (1987-1992) for the Directorates of Matrouh Governorate, tourism represents a significant part among all kind of investments (private, public, co-operative, etc.).

Another indicator, regarding the recent tendency of developing tourism, is the change of the population structure, since labour force moved from the sector of agriculture and home industry to the fast developing tourist industry along the coastal zone. This tendency gives hopes of attracting more people from outside the region, as labour demand, especially in tourism, increases, and local/regional labour availability diminishes.

However, since most of the big projects along the coastal zone are under construction, we have not a clear picture of the land use for tourist purpose, at present or at a specific future stage. It should be pointed out that the project area has certain obstacles to the improvement of this particular sector, due to **access and organisational problems** (national security reasons). The only exception is the **national priority programme** of the Tourist Development Authority.

For this reason the project area, until now, has had not any specific tourism-product identity, and accordingly, a marginal access to the international tourist market (Dragicevic, 1993). This present obstacle, however, seems to give a positive perspective, if **new goals** and **suitable strategic development programme** are to be introduced, so that to integrate the international, national and local tourist concept, and to attract more population (trained or not) in the area from other, overpopulated regions of Egypt, such as from the Nile Valley and Delta, to stimulate sustainable development and the population density better distributed throughout the country.

5.2.5. Big Projects

One of the most important characteristics of the Matrouh Governorate development, at present, is that of the big projects under construction, which obviously, when they are completed, will affect the whole land use pattern of the project area. The main types of these projects are the following:

- Tourist villages, vacation and summer houses;
- Infrastructure (roads, airport, water supply, port, telecommunications); and
- Agriculture development

5.2.6. Infrastructure

Examining the existing land use situation it is necessary to present the important aspects of the technical and social infrastructure through appropriate indicators, so that at the end, to have the opportunity to identify the lessons to be learned from the experience until now, the appraisal of the **trends** and emerged **dynamics** of the project area, and to propose **future scenarios of possible solutions.** Subsequently to approach positively the stage of land use appraisal, it is important to present one by one the existing situation of the most influential types of infrastructure (Map 3).

a) Technical

The project area is poorly connected with the urbanised Metropolitan areas of Alexandria and Cairo by all means of **transport networks**. The main highway, the railroad, and the Matrouh airport are regarded as very poor for the purpose to serve not only the regions needs and future perspectives, but also for the expected attraction of international tourism and trade. The main **highway** and the **railway** follow the coastline from Alexandria to Marsa Matrouh, and then run to inland Siwa, as well as to the Libyan border. The highway is poorly paved but its capacity seems to be sufficient for the present needs of the project area.

Parallel to the above railway and highway, a new military road to Alexandria is under construction, 20-30 km from the seashore, as well as a desert road, 80 km from the coast. Between the existing highway and the seashore there is a **secondary road** connecting the towns and summer holiday sites close to the city of Matrouh. In certain locations – mainly close to tourist villages – there are also **perpendicular roads** connecting the main roads of the area, which should also be regarded as poor and insufficient.

The **airport**, which is located within the limits of the M. Matrouh city, is very poor in terms of technical conditions. It is only used during summer periods, and serves also for military purposes.

However, the majority of tourists (local and international) arrive to the project area by train and highway, since the airport facilities are not able to accommodate efficiently the tourist flow at present, although a certain part of international tourists arrive by plains via Alexandria and Cairo. The existing **M. Matrouh harbour** is rather under-utilised at present although some improvements are needed for it to be used for the transport of people/tourists and goods. In this port trade and fishing activities are only serve in small scale. However, west of the existing port a new one has recently been constructed, but remains unused due to military obstacles. Other types of port, such as **marinas, fishing-ports**, etc. are not available.

b) Water Supply

These are four water sources in the Matrouh Governorate, **Alexandria pipeline, surface run off, desalination plants, and ground water.** The main source of drinking water, of course, is the Alexandria pipeline, which provides M. Matrouh with about 10,000 m^3/day of water. The works to enlarge the pipeline, so that to increase its capacity, are still under way (Canadian firm). So the problem of water supply during the summer season still remains the most important one.

The rural population relies mainly on **cisterns** for drinking water, and on galleries for washing. Villages also have pressurised water systems for domestic uses (Ayyad, 1995). Additional water often arrives to the area via railroad tanker cars and private trucking companies but it is still insufficient, while most tourist facilities, oil companies and construction activities, that do not have a dependable connection to the pipeline, use the private trucks.

The water supply service of the town of M. Matrouh is provided by the city council, while the management of water sources is conducted by a number of different government organisations.

c) Sewage Collection and Treatment

The sewage collection and treatment system of the M. Matrouh city is still under construction. It will have the capacity to cover the needs of 50,000 people and will be run by the city council. As we can see this system will still be insufficient even to cover the urban population needs and the city's capacity, let alone the **rural population settlements** and the **tourist/vacation complexes** along the coastline, which do not have any organised sewerage system or treatment plants.

However, in the meetings we had with the responsible managers of the visited tourist villages they informed us that they would provide separate individual sewage treatment units and plants in the area. The rest of the project area is still served by individual septic tanks where sewage is collected, while the waste water of the population in towns is directly discharged into creeks. There are practically no sanitary sewage disposal, except for few privately run units (El. Naggar et al, 1988).

It must be mentioned here the fact that the existing free sewerage system of septic tanks it percolates though sand and likely to reach the beach. The same free system is also available in many parts of the city of Marsa Matrouh.

d) Solid Waste Collection and Disposal

The existing **solid waste collection** and **disposal system** of the city of M. Matrouh cannot be regarded as effective and healthy, since the dumping is opened to atmosphere (there is no provision to be covered by earth or to use any available modern methods).

Even if the collection in the city seems to be comparatively satisfactory (offered by a private company), there is no any provision for the rural areas or the existing settlements of the project areas. The tourist village will provide their own systems of collection and disposal, but without a common structure or co-ordination of services.

e) Energy

In the M. Matrouh city **natural gas** is the main energy source, while in the rural settlements the use of **shrubs** for cooking and heating is the most popular one, but with

negative effects both on the natural vegetation cover and on the soil, because of the resulting erosion.

Recently the **power plant of the city** (generated at the Assuan Dam) – which is still little utilised – has been connected with the interconnected network, which is going to transmit the electricity to Libya. For this purpose a number of high voltage power poles have been erected along the coastline. The power plants in Marsa Matrouh produce 60 MW, only 20% of which is being utilised. The cables are in a poor condition and cause frequent electricity cut-off, but there is a plan to replace the present cables. Since there are no central transformer in the town, each building complex has to install its own transformer. In 1996 the whole system has been connected to the interconnected network. The national authorities provide power supply system services of the project area. However, all farmers rank shrubs and wood as the primary sources of fuel for cooking and heating. Kerosene is ranked as a secondary source. But, the use of shrubs for cooking and heating contributes to the devastation of the natural vegetative cover, which in turn leads to soil erosion.

Although at present a number of building complex structures, as well as the constructed tourist villages, have their own transformers, it is expected that progressively these will be serviced by the natural power systems, according to the official plans.

f) Telecommunications and Post

The telecommunication system in the area (radio-link), provided by national authorities, is very poor, and the existing 8,000 telephone lines are already utilised, mainly in the M. Matrouh City. Since there are new structures under construction in the project area, such as tourist villages, summer holiday villages, etc, the **telecommunication** and **post system** should be modernised and expanded in order to cover the present and future needs.

h) Social Services

Insufficient social services, such as education, care and health, are poorly provided in the area due to inadequate staffing, building structures and equipment.

Services in study area have a special characteristics, such following:

- Absence of governmental care with study area;
- The bad state of the present services, leakage of budget to develop it;
- Poor staffing and equipment of existing facilities;
- Some services, like education and health, are limited by the local traditions;
- Poor awareness of the population to their constitutional rights.

5.2.7. Prohibited Areas/Zones

Within the area in question there are certain zones which are regarded **as "strategic areas of military importance"** the ownership of which is prohibited to individuals. Such zones are the airport at the city of M. Matrouh, some coastal areas – mainly military campus and observatory networks – deserts lands, areas included in the land reclamation Project Plan, and areas for the establishment of new tourist areas – mainly along the coastal strip.

However, subject to the provisions of the laws No.143 of 1981 and No.7 of 1991, it is also prohibited to own or seize certain types of Land for Habitation and Agricultural Development Projects by any natural or judicial person.

The aforementioned Law has also **limited** the maximum permissible ownership of **Desert Lands**, subject to its provisions according to the results obtained by using economical irrigation methods. The Law **prohibits the drilling of any wells**, whether shallow or deep in desert lands except after the approval of the responsible authority, according to the relevant established terms and conditions determined by it, and after consultation with concerned authorities.

According to the State's Integral Socio-Economic Development Plan there are also certain locations for **free zones** – for industrial, commercial, financial and tourist areas – in the Governorate of M. Matrouh, as found also in Sinai and western desert Governorates.

Law No.59 of 1979 concerning the new communities prohibits the establishment of new communities on agricultural lands. Subject to certain restrictions is also the land of 100 meters allocated on each side of the public road leading to the new communities.

Similarly, the Law for the creation of New Urban Communities prohibits **the disposal of land of more than five kilometres around the new community** from all directions as the responsible Authority determines it. It is equally **forbidden** to exploit or use this area to annex it to the community precinct, to divide it, or to construct any establishments or buildings there, in any form whatsoever, with some exceptions.

We can deduce from the above that is very important to be determined the prohibited areas on a map in order to be examined in relation to the other land uses of the area under consideration. In addition, to check the suitability of all possible land uses, their conflicts, and generally the preservation of the area's environment.

5.2.8. Natural Environment

Considering the Fuka-Matrouh area from the point of view of its natural attractions and resources it should be mentioned the **high quality coastal stretch, the Qattarah depression and the Siwa Oasis** in the greater area. These three areas have a unique quality, visual and aesthetic characteristics, which give the possibility of an authentic adventure, tourism and recreation.

The Mediterranean beaches, of the whole coastal area in question can easily be proclaimed as the most beautiful and longest in the world with some minor exceptions, something that represent a unique tourist attraction and a **natural reserve area** of cultural value, but also as a potential resource for development of tourism and recreation activities.

In spite of this important resource of the area, the environmental Law and the responsible Environmental Affair Agency do not provide a **special framework of protection and designation** of the coastal area as a **natural park** or other type of protection zone of scientific, cultural, tourist or aesthetic value. As the result the management of this **highly important coastal stretch** seems to be ineffective since the pressure for tourist development is continually increasing in spite of the fact that this area has limited access to the sea, and there are no other types of economic development, except for tourism.

However, the Law No.4 of 1994 concerning the environment organises the protection of the earth's environment from pollution. It has entrusted to the **environmental observatory networks** the task of periodic monitoring of environmental components and pollution, and to provide the relevant data to the concerned authorities. Similarly, the article 28 of the Law No.4 of 1994 prohibits the hunting, killing or holding of wild birds and animals of the species designated by the executive regulations that also determine the areas where the provisions of this article are applicable.

It is obvious from the above information that a more detailed policy and legislation regarding the **designation of areas of special natural importance** should be formulated to provide, a clear and effective framework of environmental management and of protection and development.

5.2.9. Cultural Environment

This type of the anthropogenic attraction, which is actually the basis for creating both nationally and internationally recognisable cultural profile (or product), cannot clearly define in terms of quantitative and qualitative characteristics.

However, there are certain aspects of cultural attractions in the area, such as **archaeological, tourist and natural resources**, that can be mentioned here as examples of significant cultural environment.

Marsa Matrouh city, for example, the capital of the Governorate, which was founded by Alexander the Great, has an **urban structure and numerous beaches, natural attractions and museums** which all together could constitute an internationally important destination, and create an internationally recognised special product.

Considering the greater area, we can value the whole system of attractions – **Mediterranean and seaside resorts, Qattarah depression, and Siwa Oasis** – as a unique cultural part of national as well as Mediterranean and international importance.

In the Matrouh City we can mention also certain focus points such as: the cave and the Rommel's Museum, the Cleopatra beach, the ethnological museum, the Awam Mosque, the old harbour, and cultural institutions of the regional centre. In the rest area there are numerous cultural attractions, such as small rural settlements and urban centres, monasteries (Aboa Mina), Roman ruins (under excavation in Ras El.Hekura), and numerous archaeological mounds. In addition, Bedouin tribes are also an important attraction, especially with regard to their way of life. Furthermore, a substantial attraction is of course the nearby II World War cemetery (in El Alamein), and a major cultural heritage site, that of the ancient Marina, known as "Leokathbes" port, of El Alamein, which is also still in the process of excavation.

We must also mention here the world heritage site of **Abu Mena**, a historic site east of the Matrouh greater area, and the site of **Zawiat Al-Agdab** near Saloum, west of Matrouh.

5.2.10. Urban Environment

We have already mentioned in the previous chapters, as in that on the cultural heritage, the existence of certain larger and smaller urban centres, such as M. Matrouh, Fuka, **Galal Dabba** and the nearby Alamein and Saloum. All these together, with the small rural settlements and Bedouin tribes, constitute an attractive human settlement network which is continuously expanding to cover new urban centres and holiday tourist villages, mainly along the Mediterranean coastal region.

It is estimated that this new combined coastal urban and rural development strip will play a more dynamic role in the region – both in terms of infrastructure (urban and tourist) and of urban expansion of the existing urban centres – in view of the situation with jobs, land uses, transport networks and the re-expected redistribution and possible attraction of greater numbers of people (employees) throughout the region.

6. LAND USE POLICY AND TRENDS – ISSUES AND CONCERNS

6.1. Legal Aspects of Land Use Planning

According to the specific field of activity and to the kind of the existing land use policy, **agriculture,** as a **land use mode,** plays a central role in determining the allocation and the pattern of land uses in the project area of Matrouh-Fuka. This is because agriculture has been granted the priority for land use, so that it is by now the land use mode around which most land management issues will revolve. One of the most important consequences of this situation that can be mentioned here is the structure of the **legal aspects** covering the whole spectrum of land uses and the peculiarities of the soil resource management in terms of perspective, ad conflicts.

This consideration of the land in this region is very important in order to stimulate the agriculture activity in such a way so as to obtain any possible volume of **runoff waters.** In addition, extensive arrangements should be made to exploit it from higher-lying lands and transport it into coastal low lands, where runoff water is practically insufficient for any crop to have serious changes of success.

This water is directly conveyed, in a controlled way, to cultivated depressions, or it flows, intermittently, through Wadis, or in other cases, is allowed to spread, under control, over lowlands subject to flooding. As a consequence, this agricultural system eventually creates special strong links between cultivated and non-cultivated land. Consequently the necessity of managing and equilibrating land between agricultural and non agricultural development is going to be the **most serious land planning issue in the years to come.**

Looking at the legal aspects of the land use, we have to mention here the **1981 Law No.143** which organises the utilisation's of dessert lands, defines the procedures and conditions for administration, exploitation and disposal, the **1982 Law No.203, the Prime Minister's Decree,** which relates to the definitions of dessert governorates, such as Matrouh, and the **1991 Law No.7** relating to some pending provisions concerning the state properties in relation to certain procedures.

In the **Law No.7** there are provisions for **Tourist Land Uses**, since it stipulates that the **General Authority for Tourism Development** has the duty to undertake the management, exploitation and disposal of lands **allocated for tourist purposes** in the same way that the **General Authority of Habitation and Agricultural Development** undertakes its duty on lands allocated for **reclamation and cultivation**, as well as the new **Urban Communities Authority**, which also undertakes the duty for the land allocated for new communities.

However all the above mentioned actions, laws, authorities and their own local units have to be co-ordinated with the **Ministry of Defence** under conditions and rules which are prerequisite for the state defence. This of course complicates the problems of sufficient and sustainable use of land resources of the area.

Similarly, the **Law No.59 of 1997** concerning the ***New Communities*** designates these communities as those which contain an **integrated society**, and aiming of creating **new**

civilised centres which result in social settlement and economic prosperity, industrial, agricultural, commercial and other, with the object of redistributing the population through preparing new attractive areas, **outside the areas of established towns and villages**. According to this Law the only governmental agency responsible for the establishment of **new communities** is that of the **New Urban Communities Authority (NUCA)**, while the law prohibits the establishment of this new communities on **agricultural lands.**

Regarding the policies for local government construction it would be essential to mention here the **Law No.3 of 1982** which is concerned with the organisation and reconstruction **guidelines** for local government units by using the Law and its executive regulations for reconstruction planning, while the **Urban Planning Policy** is the responsibility of the Urban Authority Agency, which prepares all reconstruction development plans and programmes at the state level, while the Local Units prepare **general planning** projects of towns and villages (through special consideration regarding long-term needs, military-defence requirements, etc.). The main duty is to determine the various utilisation's of the Land (land use planning), including residential, commercial, industrial, tourist and entertainment areas, and other uses which conform to the nature of a town or village, its circumstances and the needs of its inhabitants.

Local Units are also responsible to define the kinds of utilisation of towns, or village lands, and to get temporary rules and conditions. These local units organise the reconstruction and the preparation of detailed planning projects for the areas included in the general planning, and which are issued as a decree by the concerned governor. The above Law organises the actions concerning permissible utilisation's of lands and buildings occupancies in the **centre area** and in the **industrial area,** and the allocation of town **quarters,** as well as the determination of public interests, the exploration of **real estate properties**, and all other objectives of **urban planning.**

According to the **Law No.4 of 1994** (the first integral law on the environment in Egypt) a new governmental agency was established, with a body for environmental protection and development under the name **"Environmental Affairs Agency".** This agency has branches in various Governorates, and its goal is to design the **general plan** and the necessary special plans for the environment conservation and development, and also some experimental projects providing standards and guidelines (averages and rates, permissible pollution limits, etc.). The Law also gives to the responsible agency the duty to prepare an **emergency environmental plan**, participation in the integrated National Plan for the administration of the Coastal Areas in the Mediterranean Sea and Red Sea.

The Matrouh Governorate has also the duty to **study** the local environmental problems (through its environmental department), to **define** them, and to **report** to the local and national agencies for designing suitable solutions. On the other hand, additional governmental authorities (Ministries of Health, Marine Transportation, Housing and Utilities, Reconstruction and New Communities, Irrigation, etc.), with their local departments, are also responsible to apply the existing **environmental legislation,** each in its field of competence.

6.2. Land Use Conflicts (Coastal and Inland), and Trends

Examining in brief the existing situation of land uses and activities in the area of Fuka-Matrouh, a great many inland and coastal **conflicts** have been identified dropping within the following **main issues**:

a) **Uncoordinated** land uses and activities, and potential conflicts among existing and future land use patterns;

b) **Deterioration** of natural resources, coastal and inland;

c) **Intensive unplanned** tourist and holiday development on the water frond producing land use conflicts;

d) **Unplanned** international land use activities close to the coastal line;

e) Cultural and recreational **conflicts;**

f) **Uncoordinated**, problematic, or totally absent provision of access to technical infrastructure and social services, and access to the shoreline; and

g) Organisational **conflicts.**

6.3. Suitability of Land Use Planning Policy

In view of the sensitivity and scarcity of the available and suitable land resources of the area under consideration, and taking into account the high **development pressures** related to rapid tourist and holiday growth, especially along the sea-sites, there is a **high risk** of learning the exercise of land use planning in an uncontrolled and undesired land use development policy pattern, as it is happening today.

The incident of huge inhuman scale of the big tourist and holiday projects, taking place in uncontrolled manner of development is a common threat to coastal ecosystems and to the land use sustainable development of the whole area under consideration in general.

The capability of the **natural systems** of the area to provide support for **a multi pattern economic development**, including energy, building materials, and traditional production, and to absorb the interference of any land pollution (ground water, seawater, land, and waste), is the critical threshold within which the area's sustainable economy can expand.

Although information and knowledge of the existing environmental systems of the area is still too limited to answer this particular question with any certainty, a host of warning signals provides us with increasing evidence that the **impact of human activities** (such as that of coastal development), in the area might have already gone beyond the capability of maintaining the integrity and productivity of natural resources.

One perspective from which this can be evaluated is that at the introduction of a **new land use policy**, among other things, the **concepts of carrying capacity**, new land management techniques, conservation guides of natural resources, and sustainable coastal development should be incorporated.

To achieve the sustainability of the current patterns of development policies, both in the level of development processes and in the level of demand for natural resources, should be considered carefully. These are influenced by the **size, volume** and **traditional local characteristics** of human activities, and also by the processes and technologies employed.

If certain measures, including **national Laws and guidelines**, are amended, it will be possible to develop a more safe framework of development of the Fuka-Matrouh area, on a sound basis, without fear of any damage to the area's sensitive environment, and more generally, without any risk in approaching the process of sustainability of the coastal natural resources of the area.

6.4. Problems of Land Use Planning Co-ordination

There are several sources creating Land Use problems in the project area, which have directly or indirectly mixed environmental, socio-economic, socio-political and socio-cultural effects. Among the most important issues observed already in the area, in order of priority, and which have resulted during the last 10 years are some of the following **group of problems:**

a) **Planning and management aspects related to all stages of development.**

b) **Marine pollution of the whole coastal region (Air and soil pollution seems to be limited).**

c) **Extensive land depredation.**

d) **Lack of any provision for natural, cultural and historic heritage preservation in the principal areas.**

e) **Land ownership aspects of all kinds**

f) **Organisational, Institutional and Legal aspects (lack of an effective authority at the local level /Governorate/ responsible for the integrated planning and management of the coastal, urban and rural affairs, with the exception of the defence requirements of the project area) (Map 5).**

g) **Infrastructure and institutional capabilities, as well as monitoring and research activities aspects.**

h) **Infrastructure, technical and social services, such as:**
   - **Telecommunication systems;**
   - **Transportation, traffic and accessibility;**
   - **Water supply;**
   - **Waste collection and disposal;**
   - **Drainage system;**
   - **Sewage collection and treatment;**
   - **Health and medical services;**
   - **Education;**
   - **Social services;**
   - **Energy;**
   - **Environmental monitoring, impact assessment and legal actions;**

i) **Geographic distribution of initiatives and public-private investments.**

j) **Educational aspects and provisions for public participation processes.**

k) **Seasonal capacity of technical infrastructure (especially water and energy).**

l) **Local market and Tourist/Holiday Market conflict.**

m) **Mobility and distribution of the local and national employment sector.**

n) **Existing settlements and new urban development patterns.**

o) **Aspects relating to main sectors of the economy:**
   - **Agriculture and Pasture;**
   - **Industry and Commerce;**
   - **Tourism and vacation activities;**
   - **Housing/Construction.**

However it is worth to mention here the fact that hierarchy of land use planning systems is not well co-ordinated and lacks public participation. However more innovation is needed for detailed consideration of the above problem areas, so that to overview positively recommendations and proposals.

6.5. Environmental Problems

The way the land use pattern is developing in the project area has a primary influence on the **types of pressures**, which are allowed to act on the environment. An environmental impact assessment of the actual land use status of the area is the most crucial prerequisite for identification and final evaluation of the nature, the degree and the impacts of the direct and indirect environmental problems. However statistics, data, existing and planed policies, as well as others necessary sectoral and sub-sectoral considerations, such as an integrated mode of environmental impact assessment of certain human activities, like that of **agriculture, tourism and infrastructure services,** are needed before any conclusion is made regarding the level and the degree of environmental awareness.

What is actually obvious is the fact that the majority of the project parts are almost undeveloped, while certain zones – mainly along the coast – are being very much exploited but without systematic employment of policies, plans, programs or necessary environmental protection measures. Therefore due to the lack of available results of analytical studies and research work in this area, it is rather without any practical value the discussion of any possible negative effects of the above main activities on the components of the area's ecosystem.

6.6. Land Use – Main Requirements

When considering the issue of land use requirements of the area, it is first of all necessary to define, evaluate and discuss the existing and the potential **land use conflicts, the kinds of obstacles** that are responsible for this situation, and the **information** on these issues that has been gathered in other areas of Egypt, as well as **comparative results and policies** hat have been already introduced in other cases of the country.

Another useful issue for land use requirements and specific consideration is the examination, through extensive studies and research, of alternative ways of implementing comprehensive policies, providing base sets of reliable and comparable development patterns reflecting sustainability. This imply the need to implement conceptual work on **key resources** of the area which can be sustainable in the long rung within the framework of a carrying capacity analysis of their land units resources.

To improve land use co-ordination of the authorities, their responsibilities and their duties, it is very important to establish a regional planning centre in the Governorate. It would be used to prepare development plans, programs and investment plans in an integrated way, so that, not only to avoid possible land use conflict, but also to prepare an actual take off of a new development pattern in the Mediterranean region.

7. DEVELOPMENT OPPORTUNITIES

From the above presented evidence we firmly believe that coastal protection, planning and management in the project area of Matrouh-Fuka have suffered mainly during the last two decades, when the tourist and summer holiday activity started, based mainly on **uncoordinated decisions** and **actions** at both the national and local levels. Accordingly, we believe that there are inadequacies in **legislation, anomalies in the planning system,** lack of central guidance system, and overlapping and conflicting policies and responsibilities (and in some cases, a lack of any real action) among a host of bodies, with poor co-ordination between them.

Much of this has arisen partly because of the existing traditional patterns of ownership of the coastal areas, and partly because the responsibility boundaries (at the national level in particular) separating the administrative powers are not drawn with regard to the presence of natural coastal processes and the possible consequences on one part of the shoreline of interference in another.

Ignoring this coastal dynamics as a principle (Fig. 5), like in most coastal areas of the Mediterranean region, has led to the present general failure to plan or protect this nation's coastal resources in an integrated and co-ordinated manner.

However, despite the world-wide recognition of the coastal areas overwhelming importance – as has already been presented in the chapter 3 of methodology above – institutional arrangements, and inter-sectoral and inter-governmental linkages are too often poorly articulated, ineffective and inefficient in the case we are examining.

Meanwhile, considering the situation where specific and dispersed interventions (mainly by foreign investors in tourism) still dominate, the time has come for concerned management, of course around a planning strategy – such as that of ICAM Planning Study we are developing here – based on balanced **development opportunities** compatible with the **coastal environment**. To achieve it, a presentation of the realistic development **potential opportunities** should be organised so that the convergence of the public policies and of the local initiatives be ensured:

- **Tourism development** of the type of four seasons (the conditions are ideal for this type of tourism), mainly for international visitors (a sector which is still not well developed) based on the natural attractions, such as superb beaches, coastal capes, special natural locations with excellent view to the shore, and other morphological sites (hills, plateau, etc.), but also on cultural heritage sites, monuments and archaeological sites.
- **Expansion of agricultural activities** through intensive programmes – similar to that of the LUPEM programme of land reclamation – incorporating greenhouse units, agricultural classification, provision of water supply from alternative resources, in combination with wind energy processes, diversification of suitable agro-product, introduction of farm, greenhouse and agro-tourism models under the principles of sustainable development.
- **Development of fish industry** not only for local demand – which has anyway been at a rather low level until now – but for the international market as well. A very

promising sector is that of aquaculture, but it should be developed with careful planning and continuous monitoring.

- **Natural attractions potential opportunities.** A remarkable feature of the shoreline *is the succession of bays, the first of which begins east of Matrouh City and extends* to Alamein. Owing to the above features, the area is distinguished from other coastal areas. The coastal capes are formed by rocky projections. The most remarkable of them is Ras El-Hekma with its excellent location, overlooking Hekma bay to the east and Abu Hashfa bay to the west. Abu Hashfa bay contains Ras Hawala, where beaches are superb for tourism (El-Bastawissi, 1989). Other locations should be mentioned here such as Ras Alam El Rum, M. Matrouh inner bay, and the water collection areas adjacent to M. Matrouh city which become special ecosystems.
- **Historical-cultural heritage.** A remarkable culture heritage site east is that of Marina/Alamein located 190 km from Marsa Matrouh, which is still being excavated, while under extremely heavy tourist development pressure on all sides. Taking into account the construction under way of a new airport, a harbour and a tourist marina, this monument will be in the near future a cultural pole with strong influence on our study area. The framework of this project area takes us in the east to the international heritage site of Abu Mena, in the south to the temple of Jupiter Amun in the Oasis of Amun-Siwa, and to the west to the site of Zawiat Al-Agdab near Salum. In the Mediterranean context, however, the site of "Abu Mena" cannot be ignored or even overlooked, as it eminently appears both in the World Heritage List and the list of "100 historic sites of common Mediterranean interest" (El-Raey, et. al, 1998). Among other major sites we can mention here are the following:

  1. *Abu Seir,* some 50 km out of Alexandria, includes many of ancient Egyptian, Roman, and Coptic monuments. Excavations are also currently underway in search of Roman monuments.
  2. *Marinul El-Alamein-* the ancient " Leokathbes "about 100 km out of Alexandria. It is a Roman settlement, still being excavated.
  3. Some interesting archaeological sites to the west of Matrouh like:
     - *Cleopatra Site:* 15 km west of Matrouh, including Cleopatra's Bath and the famous Cleopatra's Rock.
     - *Agiba Site:* at Um Al-Rakhm- about 30 km west of Matrouh, including Roman catacombs. The site is still being excavated.
  4. Some of interesting archaeological sites to the south of Matrouh like the Oasis of Siwa. Siwa includes the Temple of Jupiter Amun (temple of secrets), the temple of Nectanebo II and Gabal Al-Mawta (Mountain of the Dead).
  5. The other compelling example, with vast capacity for comprehensive development potentials, is that of the World- and Regional- Heritage *Site of Abu Mena,* which lends itself readily to fill restoration of function (if not also of form). Whereby, it can recover its past glory as a pilgrimage centre of great popularity and attraction throughout the Mediterranean region (El Ray, 1998).
- **Economic resources base for industry.** The raw materials, which are available in the region, provided the support to organic and inorganic chemical processes. These industries are very important because they can act as a nucleus, attracting other industries. The number of possible downstream operations based on both the organic and inorganic chemical complexes is very large. The choice of products,

which should be manufactured in the future, will depend on the marketing opportunities and the technical knowledge available by that time; both change rapidly. It is, therefore, premature to enumerate the possibilities.

- Socio-economic potential opportunities.
  - It is likely that members of a single family would be willing to co-operate in communal development;
  - The dominance of extended families living together as a community is an asset for implementation, particularly of model trials and action area projects where the target community would belong to a single family;
  - The project area has soils, which are likely to be suitable for the fabrication of environmentally suitable and cost-efficient construction materials with very little processing;
  - Income of needy families could be supplemented by agro-processing and traditional handicrafts, which are usually made by women;
  - Older women have more mobility and decision-making privileges. They, rather than younger women could be better targets for training.

8. DEVELOPMENT CONSTRAINTS, LIMITATIONS AND THREATS

8.1. Constraints

As concluded from the above analysis of the profile of the study area, there are important constraints which need to be taken seriously into consideration in the outline of the strategy for the planning and management of the coastal areas we are examining. The most visible examples are the following:

- Instability of the coastline due to natural processes, such as coastal erosion and sedimentation, creating an unstable coast.
- Loss of wildlife, natural habitats, and landscape degradation due to unlimited grazing – mainly by Bedouins – and hunting, uncoordinated land uses, infrastructure works and tourist/summer holiday large scale projects development.
- The ad hoc model of responsibility boundaries and authority regarding ownership and powers of control and co-ordination of the development of the area.
- Conflict legislation and available planning and management instruments concerning not only the horizontal relations between sectors of activity, but also the intermeshing of the policies and actions carried out at various levels of territorial authority. Application of the subsidiary principle (tourist villages for example) too often leads to a panelling out of responsibilities, which are simply distributed between the levels of competence, with no scope for taking account of the numerous interactions between them. Owing to this lack of co-ordination, the complex relations between human activities and the coastal environment are neglected, and the isolated measures fail to achieve their goal, or may even be mutually contradictory.

8.2. Limitations

Among the most crucial limitations of the area under consideration the following should be mentioned:

Regarding the area's surface water, it is very limited in volume as it originates from the rainfall of the winter season. Most water harvests are concentrated in the northern part. Runoff is possible after rather heavy rains, and a considerable amount of water may percolate to deeper soil layers. The main elements of the water balance of the project area is rainfall, as input, and evaporation, runoff recharge to groundwater and change to soil moisture storage as output.

The main groundwater source is the Nubian sandstone aquifer which extends to the north of Qattara Depression. In the Fuka region, there is also trapped groundwater aquifer from which water is extracted through hand dug or drilled wells, and is used for irrigation of orchards. A minimum safe yield from Fuka aquifer is estimated to be 5,000 m^3/day. Salinity is low and ranges from 2000 to 3000 PPM. The groundwater, which is suitable for agricultural and domestic uses, occurs in relatively shallow non-artesian aquifers or in small shallow semi-perched aquifers with slight artesian pressure. The non-artesian

aquifers in the coastal plain found in near land surface, are recharged directly by rainfall and the infiltration of surface runoff. The quality of the water in the several aquifers in the area varies widely according to seasons. The best quality is found in winter and the worst in autumn. Also the water contains about 20,000 ppm of solid matters, which reduces the water quality.

Other Water Facilities: Currently, an estimated 434,700 m^3 per month of water in winter and *453,300* m^3 per month in summer is supplied to the Governorate via the pipeline system, train and desalination plants for areas west of and including El- Alamein (USAID, 1988). While the rural population relies mainly on cisterns for drinking and on galleries for washing, the water resource for the main population centres comes from outside. Extension of a pipeline from Alexandria supplies public water to Ras El-Hekma (Ayyad, 1995).

There is no satisfactory system for sewage collection and effective treatment covering not only the coastal zone –which is of course very important – but also the whole study area, so that we can achieve both environmental protection and water recycling for non drinking purposes, which is essential for an area poor in water supply.

More specifically, the vacation complexes developing along the coastline do not have any sewage systems or treatment plants. Sewage is collected in septic tanks and it percolates though sand, and is likely to reach the beach. Septic tanks are used in Marsa Matrouh, too. The waste water for the population in towns is discharged directly into creeks and no sanitary sewage disposal is practised except for few privately owned separate units (El-Naggar et al, 1988).

Energy supply is also a limiting factor for the study area since the power plants in Marsa Matrouh produce 60 MW, only 20% of which is being utilised. The cables are in a poor condition and cause frequent electricity cut-off, but there is a plan to replace the present cables. Since there are no central transformers in the town, each building complex has to install its own transformer.

Infrastructure and accessibility limitations should also be mentioned, such as:

- Insufficient infrastructure for harbours (the new one has already been abandoned for military purposes), roads, railroads, airport, and specific development zones (tourist and industrial).
- Inadequate system of transportation, communication and other technical and social services. It should also be highlighted that there is a poor level of education and health services, a fact which is crucial for developing international tourism.
- Low level of awareness, as well as lack of public participation and, accordingly, positive contribution to developing plans and policies regarding the area under consideration. This particular limitation during the last years has been proven to be the key issue for planning consensus and successful development projects.
- There is a lack of specialised staff, followed by the lack of sufficient population to support extensive tourism and agrotourism programmes. There is a growing need not only to absorb more population in the area but also to provide specialised knowledge to the trainees.

A number of limitations can also be found in organisational aspects, such as:

- lack of land ownership maps and database,
- lack of infrastructure to help the Bedouins organise their own way of life within the modern system safeguarding the traditional culture in the production activities,

- *uncertainty of individual land ownership,*
- uncoordinated planning and management of big projects constructed in coastal zones, as well as smaller ones,
- overlapping authorities starting from the ministry level down to the local one.

8.3. Threats

In an era of globalisation and social and economic transformation of many areas, regions and sub-regions, the question remains in which way the process of development will be directed in the area we are studying. The local, regional, national and international factors will influence differently the existing trends and dynamics of the study area. Accordingly, the present threats should be considered as changing conditions, and the expected changes could possibly be proved to act as beneficial factors for the future development of the area. Therefore, the present dangers presented below have only relative value:

- Pressures upon the coastal ecosystems due to tourist and summer holiday development projects, as well as sea and inland pollution;
- Environmental degradation to be caused – as actually was in the past – by heavy coastal land utilisation mainly due to urban and leisure activities, port and marina developments;
- Intensive military presence along the beaches;
- Intensive future fish industry (mainly aquaculture) development; and
- Conflict between land ownership and infrastructure development.

9. RECOMMENDATION OF THE ICAM PLANNING STUDY – ALTERNATIVE SCENARIOS

In order to develop a programme of integrated management (ICAM strategy) there is need for planning and developing some basic prerequisites of the design and development of the coastal zone in the form of **alternative scenarios**, so that to enable the evaluation of the proposed planning of the study area and especially the strategic evaluation of the environmental impact assessment.

Within the basic **prerequisites**, as they develop from the examination of the existing situation, the tendency and dynamics, the expectations of the local actors – to the extent which was possible – we can mention the following:

- Growth and spatial stabilisation of the internal population flow (migrations) into the study area and development of opportunities will result in an effective **concentration of the decentralised population** along infrastructure axes (development corridors), transportation junctions and close to urban centres. This will result in decongestion of Marsa Matrouh and its urban environmental upgrading.
- Encouragement of **mixed land uses** (rural/urban/tourism) and development of sustainable processes, so that to safeguard the future of Matrouh Governorate, especially regarding the employment of Bedouins and other social groups.
- Encouragement of the **agrotourist development** (farm tourism and ecotourism).
- Concentration of the industrial development in different areas so that to safeguard the population distribution within the study area.
- Development of **alternative energy resources** in order to find sustainable, easy and low cost energy useful for industry, farm industry, agriculture, agrotourism, water production (underground, sea water desalination or recycling) and other economic activities. It must be mentioned at this point that there are good prospects for solar, biogas and wind energy (special parks are proposed in the following programme).
- Modernisation and expansion of the essential social and technical infrastructure units (transportation, communication, education, health, etc.) with which we can achieve the preparation of the region to absorb the expected development. Transportation networks (air, sea, railroad, metro, and road) should be co-ordinated effectively.
- Diversification of the sustainable tourist product so that to be used especially by the international market – today it is at a low level – and indeed for four season type of tourism owing to the special positive local climate.
- Modernisation of the existing five sea water desalination stations and proper expansion.

Accordingly, on the basis of the above mentioned prerequisites, the following five basic scenarios could be proposed:

- **Scenario I** with emphasis mainly on the **tourist sector;**
- **Scenario II** with emphasis mainly on the **agricultural sector;**

- **Scenario III** with emphasis mainly on the **industrial sector;**
- **Scenario IV** with emphasis mainly on the **agrotourist sector; and**
- **Scenario V** with emphasis mainly on the combined **light industry-agrotourism sector.**

The above five scenarios could be possibly further diversified in terms of degree of emphasis, intensity of use, scale of development and, of course, that of their combination. In this way we can produce more scenarios with the appropriate restructuring of the requirements proposed by the local officials and the public.

10. STRUCTURE PLAN – PROPOSED SITUATION

The study area of Fuka-Matrouh was considered as a potential **internationally oriented** coastal region combining not only the tourist sector, which will be used in any way as a focus activity, but also light industry, international trade and institutional activities. The location of the study area next to the Libyan border and with the Mediterranean Sea to the north, should be seen as an advantage for the development of international relations and accordingly positive growth potential.

For this purpose a mixed model of land uses and activities, such as tourism, light industry, trade, training, cultural and educational activities are planned, along with other proposed investments in the private and public sector (especially for infrastructure facilities), agricultural and energy sectors. Cultural activities seem to have a higher priority in the proposed plan (taking into account the need for extensive excavation works when the financial opportunities permit, in order to find possible archaeological sites and historical monuments).

The coastal study area has a special position in the Mediterranean tourist pattern of Egypt, with its excellent climate, its potential international orientation, but above all its commitment to culture and growth of its population structure for the period to come. That is why the coastal planning is important for the whole country, and must be organised with the double aim of reinforcing the Mediterranean regional opportunities to take care of Egypt's interests internationally, and of promoting local development for the benefit of the study area's inhabitants.

According to the proposed plan the coastal region comprises the greater M. Matrouh urban area and the 5 rural/tourist centres from Garawla to Fuka. With moderate expectations of population growth, the entire coastal area is differentiated in terms of development strategy from urban to rural and to mixed type of development.

This mixed and integrated model of planning is considered to have better prospect not only with respect to restructuring of the existing rather segregated type of development, but also to the expected growth as well as the attraction of new development. According to the proposed plan the **development strategy** moves within the following 6 main axes:

- Restructuring of the **urban form** of the greater M. Matrouh area.
- Re-planning of the existing **traffic structure** for the whole coastal region integrating all modules of transport.
- Provision of new urban/rural/tourist **development opportunities**.
- **Higher population density** should be utilised to locate workplaces that need to be easily accessible from the whole coastal region. The **new mixed urban/rural/tourist construction possibilities** will, in principle, be located in "**close-to-station areas**" in the proposed linear coastal development.
- Location of **six key areas** (points) combining stations, junctions are envisaged out of the M. Matrouh city. The realistic construction possibilities around these key points should be assessed in connection with further local planning, considering both the limitations of the "close-to-station areas" and the proposed urban/rural/tourist planning guidelines for their future.

- Development of a new **international multi-functional district** southwards to the city boundary and close to the M. Matrouh airport, combining light industrial part, free trade market, exhibition and training centres. The new district could have up to 50,000 workplaces (2020) mixed with **housing** and **tourist/cultural/educational institutions** such as a **new university**.

The above strategic planning of the coastal area is expected to act as a **dynamic financial model** for its innovative development structure, generating for the projected period (2020) real possibilities to bring the urban area of M. Matrouh together in a functional co-operation with the rest of the coastal region (integrated planning concept).

Accordingly, the observed transformation of development of the north part of the Mediterranean region (EU expansion, national competition, co-operation with non EU regions, etc.) should also be perceived as an opportunity to raise Egypt's Mediterranean profile and its development prospects.

The proposed plan covers the time period until the year 2020, which means that until then there is a need for a **detailed planning instrument** (Master plan) incorporating political goals and development opportunities for certain short periods (4-5 year plans). It was considered, however, that a more secure **long run target** is more appropriate for the case we are examining, due to certain limitations and obstacles we mentioned previously, in order for both the **sustainable development** and the coastal environmental protection to be considered as primary objectives of the proposal.

As shown on the maps (Maps 7, 8, 9), the scenario which was chosen to be used in the ICAM Planning Study as a basis for the development of its structure, is the **fifth scenario** which emphasises the mixed land use system of the balanced (to the degree that this is possible) **urban/rural** growth based on the principles of **sustainable development**.

As it became obvious from all of the above scenarios, the re-planning of the basic infrastructure axes (especially that of the road access) is considered a necessary prerequisite in order to:

- safeguard the expected urban, rural, tourist and industrial planning and development;
- avoid the possible conflict of land uses; and
- accelerate the concentration of urban and rural developments in a rather friendly environment and close to their activities.

- Thus, a **new motorway** replaces the existing international road at a distance of approximately 10 km from the existing old one, in order to lift the load off the programmed activities and land uses, as well as to limit the negative environmental consequences on the coastal ecosystems. For the development of the new motorway, **7 junctions** have been planned for the immediate – multilevel connection of the equivalent urban/rural centres (existing and new: Fuka, Hekuma, Bagoush, Hawala, Garawla, airport/M/ Matrouh and M. Matrouh city).
- The **old road axis** takes the place and use of a local road network and **development corridor**, which with the existing railway track provided with an appropriate modernisation in the form of the fast transit system, will serve both the new urban/rural centres and the surrounding development activities (tourism, agricultural, etc.). These will reach, where possible, ports – tourist marinas and the proposed coastal leisure and tourist activities.

- A **coastal zone of 200 to 250 m width** regarded as a critical zone in the coastal system of Figure 5, combined with the El Hekma area, should be **totally protected**, and if possible become a **national coastal park**, where only vertical axis (access roads) to the coasts, parking, bicycle zones, pedestrian areas (along the coast) and beach activities (see special programme and guidelines) will be permitted.
- The development of **7 tourist zones** from M. Matrouh city to Fuka with their own urban/rural centres, mixed land uses, stations and junctions which will facilitate their growth over the years depending on the developments taking place in the surrounding areas which are studied here.
- Strengthening of **training centres** (tourism, agrotourism and light industry/agriculture) and **special parks** (5 energy wind parks, environmental awareness park, exhibition centre, etc.) to support the programmed actions.
- Development of certain **zones for intensive cultivation**, industrial parks, light industrial/agro-industrial parks, and mixed agro/tourist zones.
- Hierarchical development of **sea tourism** with ports, marinas and other suitable facilities, as well as inland tourism, rural urban centres and development corridors.
- Encouragement of the development of special urban areas of the **"urban village"** type in the greater M. Matrouh area for the redevelopment of the urban framework structure of the city, absorption of the development tendency towards expansion of population growth and human actions. Their development can take place in the Planning zone III, strengthening the parallel development of the rural/urban land uses.
- Categorisation and distribution of the appropriate **planning density** in Planning zones I, II, III and IV, according to the planning provision of the special guidelines and specifications designed through the planning strategy and noted further on.
- Use of the urban part of the **railway line** with the appropriate modernisation, redevelopment and underground construction, in order to transform it into a Metro line system serving the central area, the airport and the proposed main new urban/rural centres of the city of M. Matrouh. This initial underground metro system can later be expanded so that to cover the area among the developing 6 district urban/rural centres from Fuka to M. Matrouh, and possibly the whole Mediterranean coastal region. The perspective of this fast railway system transfer from Fuka to M. Matrouh will aid to a significant extent the developing initiatives, help lessen environmental pollution, and finally attract even more population, investment and the concentration of activities at the railway junctions (key points).
- Development, not only in the capital city of M. Matrouh but in the whole coastal area, of the necessary **infrastructure** for water supply, sewage and waste collection and treatment, energy, transport, and telecommunications, as well as for education and research, in order to achieve the sustainability of the Governorate and the appropriate sustainable planning and development of the coastal area in general.

10.1. Preliminary Planning Zones

Within the study area, **two main planning zones** (Action plans) have been proposed: one urban (covering the greater M. Matrouh area) and one mixed urban/agro/tourist (for the remaining coastal area) (Map 13). Each planning zone (action plan) has been divided into subplanning zones, two in the first zone and five in the second. Both planning zones have three planning dimensions covering the **coastal zone system**: the **crucial, dynamic** and

independent zones, at a distance of approximately 200 to 1000 m for the crucial, 1-6 km for the dynamic, and 10-16 km for the independent one.

The **preliminary planning zones** should be examined in a more detailed way within a framework of the **local plan** (Action plan) in accordance with the **guidelines** (see special reference), the planning regulations and the co-ordination requirements of the whole integrated coastal system.

The **urban planning zone 1** (Map 14) incorporates two sub-zones: that of M. Matrouh and Ras Alam El-Rum with a total population of 200,000 in the year 2020 at a surface area of 805 km^2, giving a density of 212 persons/km^2. Within this planning zone 1, there is a provision for **two tourist coastal sub-zones** with a surface area of 47 km^2 (max. depth: 3 km) (Fig. 10). Furthermore, in this zone we have protection areas, such as a coastal zone of 200-250 m, and about 5 natural and cultural monuments (Map 15).

Planning zone	Sub-zone 1	Sub-zone 2	Sub-zone 3	Sub-zone 4	Sub-zone 5	Sub-zone 6	Sub-zone 7	Outside tourist zones	Total area
1	26	21						758	805
2			32	21	29	21	23	1669	1795
Total	**26**	**21**	**32**	**21**	**29**	**21**	**23**	**2427**	**2600**

Figure 10: Tourist Development Sub-Zones within Planning Zones 1 and 2 (km^2)

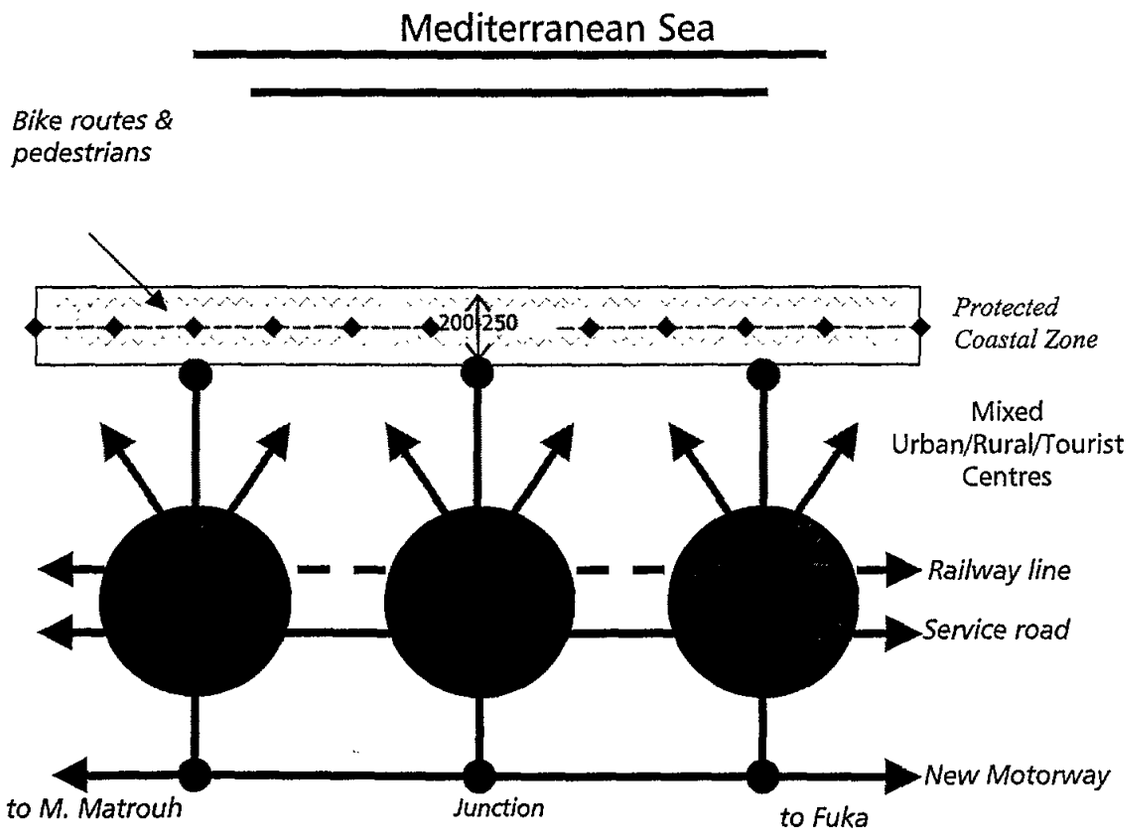

Figure 11: The Mixed Land Use Planning Concept

Similarly, the **mixed urban/rural/tourist preliminary planning zone 2** (Map 14) incorporates five subzones: that of Carawla, Ras Hawala, Mersa Boggush, Ras El-Hekma, and Fuka, with a total population capacity of 180,000 inhabitants for the year 2020 at a surface area of 1,795 km², which gives a density of 109 persons/km². Within this preliminary planning zone 2 there is provision for **five tourist coastal sub-zones** with a surface area of 126 km² (max. depth 3 km) and tourist capacity of 500 persons/km² for beach activities (Fig. 10). Apart from the protected coastal zone of 200-250 m, we have in this zone one natural monument, that of Ras El-Hekma, with high value and international reputation.

In Figure 12, we propose a **planning control system** to be applied for the effective safeguard of the sensitive coastal environment. In the same figure some of the possible permitted human actions are proposed for the three zone coastal system as well as their capacities. Further details should be available in the second phase of the ICAM Planning Study when the basic development and planning figures will be approved (Parpairis, 1998).

Coastal system	Coastline (km)	Coastal area (km²)	Tourist capacity (beds)	Local population	Total population	Degree of control	Main activities/uses
Critical zone (0.2 km)	170	20	-	-	-	Absolute	Beach activities
Dynamic zone (3.0 km)		300	100,000	100,000	200,000	High	Tourist, residential, buffer zones
Independent zone (the rest within the study area)		2280		280,000	280,000	Partial	Mixed land uses, light industry, rural areas
Total	170	2600	100,000	380,000	480,000		

Figure 12: The Coastal System Zones, Main Uses and Capacities (Tourists and Local Population)

However, the importance of coastal habitats and natural ecosystems calls for the **biodiversity** and environmental considerations to be accounted for in determining detailed level and degree of development of the area could be permitted. **Criteria** for the application of a detailed planning and management scheme for such a coastal ecosystem should be proposed in the **second phase** together with other analytical techniques and suitable tools for a unique **biodiversity sustainable strategy** for the entire coastal area.

In the Map 15, only a general scheme for biodiversity, as well as cultural protection and conservation has been drafted for the study area, identifying only the crucial areas to be protected according to their environmental qualities and requirements.

However, the problem of the effective protection of the entire coastal system calls for a more detailed approach – within the framework of the **action plans** – through extensive survey for each identified area or monument, so that not only the natural and cultural environments are protected, but also the sustainable way of development of the areas, mainly for tourism and for the related infrastructure. In this way it is expected that certain types of ecosystems will be identified, classified according to the IUCN classification system (I, III, IV, V and VI), and designed for each of these types and categories consequently, governing the protection and conservation requirements and the possible nature, degree

and form of any development, like leisure and tourism, but also mixed agro/tourist activities (Parpairis, 1997).

10.2. Action Plans and Programmes

Within the framework of the ICAM Planning Study's first phase, it would be useful to consider the basic figures of the proposed action plans: that of **population, tourism** and the main structure of **land use requirements.**

Regarding the **proposed population capacity** for the projected year 2020, in the **Planning zone 1**, 200,000 inhabitants are located in the subzones 1 and 2 (180,000 and 20,000 respectively) while in the **Planning zone 2**, 180,000 inhabitants are distributed in the five sub-zones (35,000, 30,000, 45,000, 25,000 and 45,000 respectively) (Fig. 13). It was estimated that the total population growth of 380,000 inhabitants should be distributed within the 2 planning zones in a total surface area of 2,600 km² of the study area which gives a gross density of 146 persons/km² (Fig. 14).

Year	Total population	Projected population in the preliminary planning zones						
		Planning zone 1		Planning zone 2				
		1	2	3	4	5	6	7
2000	110,000	90,000	?	?	?	?	?	?
2010	200,000	120,000	8,000	14,000	12,000	16,000	10,000	20,000
2020	380,000	180,000	20,000	35,000	30,000	45,000	25,000	45,000

1–Marsa Matrouh, 2–Alam El Ram, 3-Garawla, 4-Hawala, 5-Baggush, 6-Hekma, 7-Fuka

Figure 13: Population Distribution in the Study Area in Year 2020

	Matrouh Governorate	Study Area Fuka-Matrouh	Preliminary Planning zone 1	Preliminary Planning zone 2
Area (km²)	212,000	2,600	805	1795
Population	211,966 (1996)	380,000 (2020)	200,000 (2020)	180,000 (2020)
Density (inh/km²)	1	146	248	100

Figure 14: Projected Population and Densities on the Level of Governorate, Study Area and Planning Zones

Year	Total number of beds	Projected tourist accommodation capacities (beds) in the preliminary planning zones						
		Planning zone 1		Planning zone 2				
		1	2	3	4	5	6	7
2000	40,000	?	?	?	?	?	?	?
2010	66,000	14,000	8,000	6,000	8,000	14,000	6,000	10,000
2020	100,000	20,000	15,000	8,000	12,000	20,000	10,000	15,000

1–Marsa Matrouh, 2–Alam El Ram, 3-Garawla, 4-Hawala, 5-Baggush, 6-Hekma, 7-Fuka

Figure 15: Tourism Distribution in the Study Area 2020

Similarly, the tourist development – in all possible **forms** (hotels, villages, hostels, camping sites), **types** (mixed, tourist, summer holidays) and **categories** (3, 4 and 5 star units) – in the coastal region has been proposed and distributed in the following capacities in each action plan and its sub-zones (Fig. 15). During the projected period and according to the detailed master plans of the second phase (the existing situation is presented in Figures 16, 17 and 18) it would be possible to restructure the synthesis of Figure 15 so that to approach better the national and international demand for certain types and categories of tourist accommodation of the coastal region. The possibility of improving the airport of M. Matrouh as well as the new one near El Alamein will help further the tourist development.

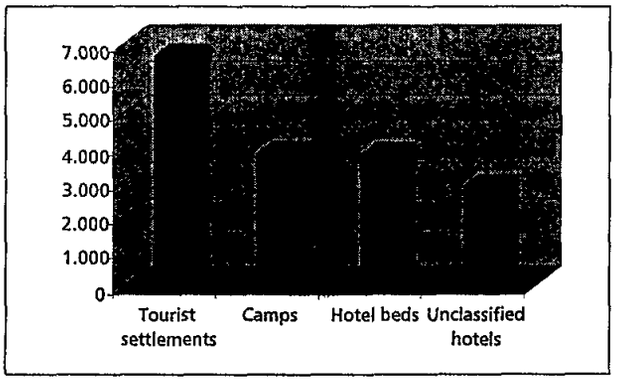

Figure 16: Tourist Accommodation Capacity in 1992 (Quantity Indicator)

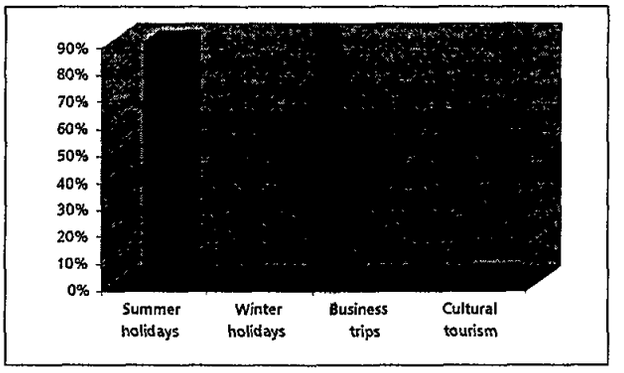

Figure 17: Tourist Accommodation Categories in 1992 (Quality Indicator)

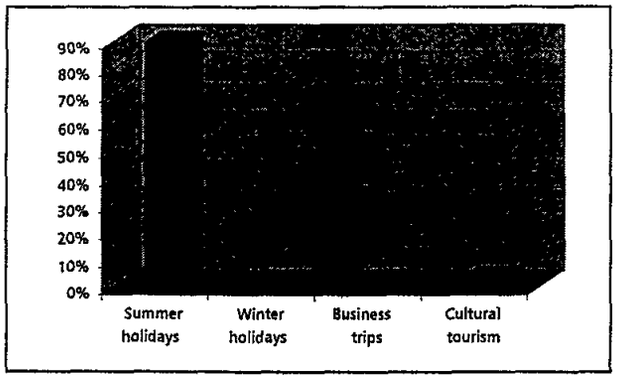

Figure 18: Motives for Tourism in 1992 (Trends and Attraction Indicator)

So the necessary **space distribution** in categories and types (models) of the tourist total proposed accommodation capacity should be further studied in the light of the **carrying capacity assessment** (Final Draft Report of Prof. El-Raey, Parpairis, 1997) as well as the result of the 1998 detailed **action plans** to be drafted in the second phase. In this study, all possible **parameters** of the tourist sector will be examined carefully parallel to the necessary associations with the urban, rural and mixed land uses already proposed in the planning structure of the 7 subzones of the coastal study area.

Accordingly, the **tourist sector**, which is the most crucial activity in the study area, should be examined in the second phase together with the accompanied **infrastructure requirements** (leisure facilities, sport, tourist marinas, cruise ports, etc.) and other possible **supporting facilities** within the integrated ICAM Planning Study, and the possible new development in the remaining sectors of the economy, the quality and the way of life (income, employment structure, education and training, etc.) of the local population, but also of the attracted national and international visitors.

Meanwhile, issues such as **environmental protection, collection and treatment** of the **sewage** and that of the **solid waste, water supply,** and **alternative energy production** will remain in priority for the study area together with the provision of **safety** and **quality** requirements for the whole area under consideration. Accordingly, the above infrastructure requirements should be carefully planned and developed before any new tourist project is approved. In the meantime, there is an urgent need to start a **new study** (urgent action) of the existing tourist project and those under construction, so that to be integrated within the proposed action plans 1 and 2.

10.3. Strategy and Measures for Sustainable Planning and Development

Further planning work will be concentrated on specific **central sites** with high priority. In addition, the planning work will be directed to clarifying the relationship between the **current local planning framework** of the study areas, for site planning or action plans and master plan, in the rural areas (outside the M. Matrouh urban area) and in the greater Matrouh city area, and that of **urban development strategies** that have been decided upon in the Ministry of Physical Planning.

Attention will be focused on trying to achieve a further movement of the total **population** capacity (immigrants) of the nation into the study area in **satellite new mixed planning centres** and indeed **"close-to-station"** areas (see the mixed land use planning concept of Fig. 11), as they are placed in favour of better distribution of human resources outside the already congested urban area such as M. Matrouh city, especially its coastal part. In this way the second target of supporting the effective **mix of urban and rural land uses and activities** with that of the **tourist and summer holiday development** of the area, would be approached. Requests for larger tourist developments, which would significantly interfere with the possibility of achieving this movement of population, cannot be expected to be promoted fully, and if necessary, efforts will be made to limit them through detailed and integrated local planning and effective control regulation and authorities.

Possibilities will be generated of creating **new urban/rural centres**, in sufficient quantities (6 new centres apart from the existing one of the M. Matrouh city) to make it possible to retain, or if possible, to increase the number of inhabitants moving into the coastal region (a tendency already observed). On this basis, the following new areas are zoned for mixed land uses incorporating **working places**, rural/tourist complexes, as well as **urban and land use facilities**. The large, partly undeveloped coastal area in the back of the coastal

zone (2-3 km away from the beach site), will be zoned mainly for **mixed land uses** in preparation for establishing **step by step** new urban/rural residential areas or of the type of **"urban villages"**, while a provision of a green buffer zone and reserve should be made for future consideration.

Light industry, as well as trade and office buildings, education and training structures, and other supplementary facilities would also be attracted for the **diversification of the building new mixed structure** combining multi-economic, social and cultural activities, supporting simultaneously the tourist and summer holiday development as well as the expected flow of population migration into the study NWG coastal region.

A number of **infrastructure adjustments** in the framework of the **action plans** have also been planned, in accordance with the development of land uses in the 6 new centres as well as in the existing one of M. Matrouh. The planned multi purpose mixed activities, including the housing areas, can be carried out in accordance with the implemented localisation planning process (need for exclusive action plans for each new centre, well co-ordinated with the proposed general coastal structure). However, priority should be given for detailed planning and management to the attractive but very sensitive areas along the beach site (water front), and areas close to the new urban/rural centres.

The new **multi-complex district** outside the city of M. Matrouh next to the airport is planned also to play the **international focus point** of absorbing more population movement, economic activities (industry, light industry, offices, education and training, culture and tourism), as well as manufacturing and commercial enterprises and trade facilities representing the NWG region international profile.

Especially the **industrial areas** (heavy or light) should be distributed throughout the study coastal region for minimising the population movements and creating more environmentally friendly zones and parks close to residential areas and new centres. The combination of the extra supported facilities (education, training, conference, health, etc.) in the proposed industrial zones and light industrial parks will provide more variable spatial structures, sustainable development opportunities, and better socio-economic integration possibilities.

Moreover, there is the need for an effective sustainable planning and development process of the coastal region, and an integrated planning and management **strategy** concentrating efforts, should be planned to **reduce the scale of structures,** and especially that of the big projects (mainly the tourist and summer holiday projects which are in a construction phase), **integrate urban, rural and tourist activities**, and **mixed land uses**, in an effort to minimise the danger of urban, rural and tourist isolated zones (basic limitation of the existing situation), further environmental deterioration, and more social and cultural separation.

From the above suggestion it becomes clear that the issue of **integration** of all human actions is the focus element of the whole ICAM Planning Study strategy proposed for the study area, in the context including, among others, the provision of the following characteristic advantages:

- **Co-ordinating** and **matching** of environmental, economic and social values.
- **Co-ordinating** and **harmonising** the planning operations and other functions of the diverse agencies and organisations having responsibilities with impact on the coastal area.
- **Blending** and **securing** (in a synergy way) the value added – amongst the **measures** employed – through the planning and management process.

- Working towards **consensus** amongst the involved "actors", so that they may share a common vision and are conscious of the consequences of implementing the proposed plan or even a vision for their area.
- **Securing public participation** and the expected consensus of all "actors" involved in the planning process, and finally
- Reporting any kind of conflicts or disputes continuously through feedback mechanisms to be incorporated within the planning mechanism (possibly within the proposed new coastal authority).

In this way, inevitably the process of the **coastal zone planning and management** of the study area, in this context, is a rather **multi-dimension process** including:

- Guidance,
- Planning and study,
- Participation, and
- Feedback mechanisms

Accordingly, the above presented, in a draft way, **general strategy** and the **main measures**, should be further analysed, organised and well evaluated in a **second phase** of the ICAM Planning Study, so that to be incorporated successfully into the final ICAM Plan.

10.4. Management Proposals – Planning and Management Tools and *Guidelines*

The subject of the **mixed land use**, proposed in the ICAM Planning Study for the study area, is a sustaining quality proposal, **redistributing** the urban, tourist and rural activities and functions, **improving** the coastal environment, and **revitalising** the whole NWG region. However, how to mix different land uses (housing, manufacturing, agricultural, tourist and commercial enterprises) is regarded as a **critical point**. Some characteristics are the following:

- Strengthening the urban forms through mixed land use;
- Handling environmental management;
- Integrating neighbourhoods (new and existing especially tribes);
- Humanising the coastal environment through mixed land use (avoiding zone separation);
- Redeveloping the built environment by stimulating the processes involved;
- Providing sustainable and resource-concerning development that improves everyday life of the local population as well as that of tourism and holiday makers; and
- Regenerating a multi-ethnic and social mixed people and land use areas.

Meanwhile the structure of the proposed **planning programme** should incorporate, as a priority, the following **basic planning and management tools** as well as **guidelines**, as similar provision is mentioned in the Guidelines No R (97)P of the EU:

a) The principles, measures and special instructions;

b) The planning legal, institutional and administrative framework; and

c) The planning and management tools and guidelines.

a) The Principles, Measures and Special Instructions

a1) Basic Principles of Coastal Planning and Development

- Avoidance, protection and therapeutic action, allied with the need for sustainable development, as mentioned at the Rio de Janeiro conference.
- Restoration of the damage already done to the environment.
- Appropriate management of the cultural and natural resources, especially the sea, respective to the renewal capacity, adopting a long term approach.
- Tourist development complying with the qualitative demands and respecting the special characteristics of the region.
- Spatial framework of the tourist development at a level relative to the social and ecological carrying capacity of the region.
- Urbanisation that is strictly controlled and which ensures the specific protection of coastal areas of great scientific, ecological, cultural and archaeological interest.
- Tourist development designed so that it covers the needs of the local community and protects its socio-economic interests.
- Balanced development of the mainland.
- Protection of important coastal habitats and natural areas, in particular of lakes and wetlands.
- Balance between different activities, such as agriculture, fishing, tourism, housing, and industry.
- Free access to the beach, respecting the natural characteristics and values.

a2) Measures of Coastal Protection

- Enacting legislation which provides protection of a significant part of the coastal zone, whose width should reach the natural limits of the land-sea functions.
- Enacting of a specific protection regime for as many areas as possible (land or sea areas), especially those which are considered as significant sites, or landscapes, or are characteristic of the natural and cultural heritage of the area, or of the state, and which are necessary for the maintenance of the biological or the coastal balance, or have still ecological significance.
- Protection of the areas which are still unspoilt and especially sensitive, through a policy which will control land use in every purchase, lease or management agreement.
- Insurance of the free access of the public, only when it is ensured that this will not jeopardise the interests of the land owners, of the nature or of the environment.

a3) Special Instructions

- Ensuring that all the tourist activities which are completed conform with the laws and regulations which have been adopted for the environmental protection.
- Assessing often the impact of the tourist activities on the coast, and ensuring that the carrying capacity of the tourist areas has not been exhausted.

- Taking into consideration the appropriate standards for drinking water, water for washing, sea water and waste, and lessening the emission of toxic substances.
- At coastal resorts, to ensure that the management and cleaning installations for the waste (including the connection with the main sewage pipe, the recycling and distribution systems for the waste) use appropriate equipment for the local population and the number of tourists, checking often the good function of these installations.
- Installing appropriate tools for the monitoring of the pollution levels, and offering alternatives for the avoidance of the pollution due to land sources, including the tourist establishments, or pollution due to accidents such as oil spills.
- Connecting with other sectors whose activities affect the coast.
- Promoting technological innovations and ways of reducing the consumption of water and energy, and the respective production of waste.
- Limiting the circulation of cars and sea transport.
- Legislating strictly the circulation on coasts and coastal zones.
- Promoting the use of public transport and encouraging means of transport which are less noisy and polluting, as well as constructing pedestrian zones.
- Ensuring that the beaches are cleaned often, through a systematic microbiological assessment of water quality and informing the public.
- Increase the participation of the public in the problems of the development and protection of the coastal environment.
- Developing information campaigns and education programmes for:
    - Tourists and tourism professionals so that their knowledge in the field of environmental protection is increased, not only for their admiration but also for the sensitivity of certain landscapes and the significant value of a certain often devalued cultural heritage, local culture and local traditions.
    - Decision-makers, so that they become capable to choose the most appropriate and viable development type for their Municipalities.
    - Local authority staff for the advancement of the tourism and the carrying out of certain accommodations.
    - Local population, so that they are informed not only about the attractive points of their coastal region, but also about the sensitivity of the coastal areas they inhabit.
    - Appropriate personnel for the urban planning and restoration-redevelopment, so that they aid in the promotion of an environmentally sensitive architecture.

b) The Planning Legal, Institutional and Administrative Framework

b1) Legal Framework

Although Egypt has already enacted a number of laws related to environmental issues (Law No. 4), it should be mentioned here that there are difficulties in applying effective coastal environmental protection due to the absence of a strategic provision of Environmental Impact Assessment (EIA), either in the latest Law No. 4 or in any other documentation. Similar findings of the El-Ray report (1999) reflect some weakness of the

existing Law system which should be further expanded to cover Strategic Environmental Assessment (SEA) requirements.

Concerning the existing partial coastal environmental protection, it should also be mentioned that there is a need for a review of the plethora of laws and regulations and co-ordination efforts in order to be capable of taking effectively the conflicting views and demands of those involved in the coastal development.

For the proposed preliminary action plans 1 and 2, it would be useful to construct a new law framework, specially designed for this case – even as a pilot law framework – so that to deal with protection and development issues.

b2) Institutional Framework

Under the provision of the Law No 4 (1994), a new Agency, the **Environmental Affairs Agency**, was created with the prime goal to carry on the exercise of the Law for environmental protection. However, such central Agency seems to be far away for a problem solving process, exercising successfully both the permission and the control (monitoring) of any development taking place within the responsibility boundaries.

Taking into account also the weakness of the overlapping planning authorities (Map 5), more efforts should be directed towards the co-ordination and integration of authorities and legislation. It would be an advantage if **a new Agency**, responsible for the entire planning and management of this study coastal area, was created based in the capital city of M. Matrouh, and responsible for the whole **coastal region** of the NW Governorate – including that of the study area – together with a new legal framework, and supporting funds available for the purpose of regulating effectively all possible affairs within the coastal area.

b3) Planning and Management Tools and Guidelines

The above proposed new coastal area Agency for the NWG coastal region, incorporating that of the Matrouh-Fuka study area, should be organised with suitable financial resources, power and authority including programming, planning, controlling and monitoring (Fig. 1). In this way the whole spectrum of the planning and environmental control (a critical part of the development process) would be exercised effectively for both sites: that of the Agency as well as that of the developer, since everybody will be able to plan and programme in advance and in a safe way.

For the same purpose, the Agency should be organised with the necessary **executive authority**, special planning and management **regulations**, **strategies** and special **guidelines**, as well as suitable personnel and expertise covering the complex aspects of the Agency's affairs. Within the responsibility boundaries of the Agency should also be the development of **close relations** with the already created national (Egyptian Environmental Affairs Agency) one, aiming to move as an efficient and well co-ordinated entity. Accordingly, special **guidelines**, such as EIA ad SEA, should be previously checked and appropriately adapted to local circumstances in an effort to establish flexible, well informed and value evaluated mechanisms.

Finally, the evolution of the central Agency's powers to move close to the study area's environment, seems to be **realistic**, close to the **problem solving process**, and more able to prepare **incentives**, environmental standards and guidelines, environmental profiles, annual and emergency reports, public participation and public educational procedures, surveys and monitoring exercises and other activities.

Table 1: Matrix of Evaluation of the Foreseen Actions

Variables / Actions in hierarchy		Actions			Impact			Zones of Influence			Obstacles				Feasibility		Sources of Finance			Responsibility			
		Urgent	Medium-term	Long-term	Ecological	Economic	Social	Local	Regional	Ultra-Regional	Financial	Institutional	Natural	Technological	Without problems	With problems	National	Local/Regional	International	National (N)	Regional/Local (R)	Private (P)	Exterior (E)
1.	**Institutional Investment**																						
1.1	Establishment of a Regional Coastal Zone Commission	*			*				*			*			*		*	*			*		
1.2	Finalization of the ICZM Preliminary Planning Zones	*			*	*		*	*			*			*			*			*		
1.3	*Preparation of an emergency* environmental plan	*			*			*	*			*			*		*	*			*		
1.4	Establishment of the environmental observatory *network*		*		*	*	*	*	*	*	*	*			*		*	*		*	*		
1.5	*Designation of protected* coastal areas (natural and culutral heritage areas)	*			*			*	*			*			*			*			*		
1.6	Designation of suitable agricultrue and aquaculture for intensive production	*			*	*	*	*	*		*			*		*		*			*		
1.7	Control of tourist development	*			*	*	*	*	*	*	*	*			*		*	*			*		
1.8	Designation of special park zones and free tax trade	*			*	*	*	*	*			*			*		*	*		*	*	*	*
1.9	*Preparation of the detailed* ICZM plan (structure and Master Plan)	*	*		*	*	*	*	*			*			*			*			*		
1.10	*Finalisation of the Master* Plan of planning zones 1 & 2	*	*		*	*	*	*	*			*			*			*			*		
1.11	Implementation of the detailed ICZM plan		*	*	*	*	*	*	*	*	*	*				*		*	*		*		
1.12	*Strategic Environmental* Assessment	*	*	*	*	*	*	*	*	*		*		*		*	*	*	*	*	*			
1.13	Management studies	*	*		*	*	*	*	*	*	*	*			*			*			*			

Table 1: Matrix of Evaluation of the Foreseen Actions - Continued

Variables / Actions in hierarchy		Actions			Impact			Zones of Influence			Obstacles				Feasibility		Sources of Finance			Responsibility			
		Urgent	Medium-term	Long-term	Ecological	Economic	Social	Local	Regional	Ultra-Regional	Financial	Institutional	Natural	Technological	Without problems	With problems	National	Local/Regional	International	National	Regional/Local	Private	Exterior
2.	Policy and legal																						
2.1	Introduction of incentives for infrastructure works (legal action)	*	*	*	*	*	*	*	*	*	*	*		*	*		*		*	*	*		*
2.2	Introduction of incentives for Development projects		*	*	*	*	*	*	*	*	*	*		*	*		*	*	*	*	*	*	*
2.3	Preparation of development guidelines	*	*		*	*	*		*	*		*			*		*	*			*		
2.4	Preparation of coastal protection guidelines	*	*		*	*	*	*	*	*		*	*		*		*	*		*	*		
2.5	Development agreements	*	*	*	*	*	*	*	*	*	*	*		*	*		*	*			*		
2.6	User changes		*	*	*	*	*	*	*		*	*				*		*	*		*	*	*
2.7	Planning and management studies		*	*	*	*	*	*	*	*	*	*			*			*			*		
	Master plan for the sub-		*		*	*	*	*	*		*	*			*			*			*		
	Coastal hazard protection and climate changes	*	*	*	*	*	*	*	*	*		*	*		*		*	*		*	*		
	Coastal land use planning and SEA		*	*	*	*	*	*	*	*		*			*			*			*		
	Regional and local land use plans		*	*	*	*	*	*	*	*		*				*		*			*		
3.	Infrastructure investment																						
3.1	Development of the main ICAM planning axis	*			*	*	*	*	*	*	*	*			*		*	*			*		
3.2	Introduction of research and training centres		*	*		*	*	*	*	*	*	*			*		*	*			*		
3.3	Development of the "mix land" use and "urban village" concepts	*	*	*	*	*	*	*	*			*	*			*		*	*		*		
3.4	Development of the main technical infrastructure	*	*		*	*	*	*	*		*	*		*	*		*	*	*	*	*	*	*
	Water supply	*	*	*	*	*	*	*	*		*	*		*		*	*	*	*	*	*	*	*
	Sewage/waste systems (collection, treatment)	*	*	*	*	*	*	*	*		*	*		*		*	*	*	*		*	*	*
	Roads/rail/airport/seaport	*	*	*	*	*	*	*	*	*	*	*		*		*	*	*	*	*	*	*	*
	Telecommunication system	*	*		*	*	*	*	*	*	*	*		*	*		*	*	*	*	*	*	*
	Recycling schemes		*	*	*	*		*	*		*	*	*	*		*	*	*	*	*	*	*	*
	Renewal energy programme (wind energy parks)	*	*		*	*	*	*	*	*	*	*	*	*	*		*	*	*	*	*	*	*

Table 1: Matrix of Evaluation of the Foreseen Actions – Continued

Variables / Actions in hierarchy		Actions			Impact			Zones of Influence			Obstacles				Feasibility		Sources of Finance			Responsibility			
		Urgent	Medium-term	Long-term	Ecological	Economic	Social	Local	Regional	Ultra-Regional	Financial	Institutional	Natural	Technological	Without problems	With problems	National	Local/Regional	International	National	Regional/Local	Private	Exterior
3.5	Development of the social infrastructure	*	*	*	*	*	*	*	*	*	*	*		*	*		*	*	*		*	*	*
	Social services	*	*	*	*	*	*	*	*		*	*		*		*	*	*	*		*	*	*
	Health facilities	*	*	*	*	*	*	*	*		*	*			*		*	*			*	*	*
	Educational and training employment programmes		*	*	*	*	*	*	*	*	*	*			*			*	*		*	*	*
	Special agrotourism programmes		*	*	*	*	*	*	*			*	*		*			*			*	*	*
4.	**Human capacity building, monitoring and information investment**																						
4.1	Information system		*	*	*	*	*	*	*	*		*		*	*		*	*	*	*			
4.2	Environmental information management (GIS, RS)	*	*	*	*	*	*	*	*		*	*		*	*			*			*		
4.3	Monitoring evaluation, feedback process		*	*	*	*	*		*	*	*	*		*	*			*			*		
4.4	Environmental education awareness and participation programmes		*	*	*		*	*	*			*			*			*			*		
	Score Total																						

11. STRATEGIC ENVIRONMENTAL ASSESSMENT OF THE PROPOSED ICAM PLANNING STUDY – QUALITY CARRYING CAPACITY ASSESSMENT

As we have already pointed out, despite numerous mechanisms established for the environmental protection (Law No. 4/1994) and the application of EIA to some proposed development projects, the Mediterranean coastal resources – internationally important ecosystems – are diminishing rather than increasing. This situation is applicable not only to Egyptian coastal areas, but also to most other national coastal areas especially in the Mediterranean region. As a result, habitat loss is continuing and the natural coastal characteristics are disappearing. According to international research studies, more than 50% of the internationally important estuaries face the threat of losses by direct or indirect human actions. Among them, 26 estuaries in the Ramsar/SPA network have suffered recent losses.

Reports by international, national and non-governmental organisations confirm that coastal management practices are poor and that there is a need for better co-ordination and guidelines.

Accordingly, the study area of Matrouh-Fuka, as well as other areas of Egypt, call for management of the wider coastline, and state what is missing is the national policy framework for the coast as a whole (the above proposed Mediterranean coastal Agency is moving within this line), because **integrated coastal zone management can help save the remaining estuaries and their wildlife by treating them as functional units.**

Policies and management plans that are incorporated in the above proposed scenario, at a rather local level, need to be, first of all, linked together by regional and national policy frameworks, and then all uses of the coastal area should be integrated. This means that a strategic environmental assessment is needed before the second phase of the detailed approach. It is at this level that attention must be focused on truly **strategic planning** of the coastal zone and Strategic Environmental Assessment (SEA). Although there may be problems in practice with the distinction between local, regional and global impacts, this recommendation deserves support.

Moreover, if further policy measures for coastal environmental protection are to be introduced, as a result of the SEA, the measures themselves will need appraising for their effectiveness. Three main areas for improvements of the policy-making process could be proposed:

- Anticipation of the macro environmental, social and economic effects of the proposed plan;
- Integrated analysis and responses; and
- Flexibility and effectiveness in environmental control.

Such arguments have been repeated in the more recent work of OECD and other organisations (Therivel, 1995). The virtues of a more strategic approach are therefore being advocated by both international, national and governmental agencies as well as by the conservation lobby.

Consequently, after the scope of the SEA for the proposed development scenario of the study area has been agreed, the following main steps should be proposed for the second phase of the ICAM Planning Study:

- Collection of the baseline data;
- Impact assessment (prediction);
- Impact evaluation and synthesis (significant impact to be evaluated); and
- Proposing mitigation measures and preparing a special SEA report.

Recommendations will be derived from the findings of the impact evaluation and may include:

- Identification of the preferred alternative;
- Mitigation measures; and
- Monitoring measures and feedback that may be necessary.

Techniques that could be used in the light of SEA findings to select the scenario for implementation (among a choice of alternatives), include the application of evaluation criteria, public participation, and consultation with other agencies, while often, impacts will have to be evaluated despite a level of uncertainty concerning their likelihood or risk. It is also possible that the use of pilot projects and contingency plans will reduce the level of uncertainty and of risk posed by this uncertainty. In this line, **carrying capacity** and **sustainability** should provide fundamental criteria by which to evaluate impacts. On the other hand, distinctions should be made between **short-term** and **long-term impacts**, and **reversible** and **irreversible impacts**.

The **final product of the EIA** should be a **formal report** incorporating the findings of each stage of the process, in the form of a tax and supported by overlays, mapping, photomontages, models, matrices and summary sheets and any other possible useful material. However, as pointed out in the El Raey 1999 report, the problem in obtaining maps, information and data on the study area, as well as lack of co-operation among the agencies, are responsible for the ineffective application of the above proposed SEA process. This means that efforts should be made to overcome these obstacles during the second phase of the ICAM Planning Study.

12. CONCLUSIONS AND RECOMMENDATION

The analysis of the existing situation of the study area's coastal zone, although not quite comprehensive and detailed (due to lack of real-time baseline data, maps and information), shows that the realisation of the ICAM Planning Study goal, that of integration and sustainable development of all human actions, depends to a large extent on a more complete and systematic application of the **principles of integration** and of **subsidiarity**. Accordingly, the proposed draft plan and programme have been centred on the conditions for the application of these principles – some of which are presented in this report – in the forefront of which feature the co-operation mechanisms between numerous public and private actors who influence the evolution of the coastal zones.

As a conclusion, the study area's main components and proposals presented here will be marked by the following main **axes**:

- **Opening up the area's national and regional borders** towards the construction of a new international profile;
- **Implementing a primary structure of the ICAM Planning Study** of three planning dimensions: Regional (Planning zone 1 and 2), District (master plans of each sub-zone), and Local (detailed plan for each mixed urban/rural/tourist centre or project;
- **Diversifying economic development** through mixed land uses, as well as educational and training opportunities, so that to solicitate further population growth (through migration) and employment opportunities;
- **Implementing an effective infrastructure programme** including technical, social, economic and environmental (Biodiversity and natural – cultural protection) programmes;
- **Integrating planning and management processes** based on the principles of sustainable development, carrying capacity requirements, and those of the SEA tools (protection of special areas, introducing public fast transport, and the use of bicycles, renewal energy plans, etc.);

Accordingly, the principle aim of this document is to apply the first step of the ICAM Planning Study and programme which was approached mainly through the synchronisation of the necessary planning of multiple issues in coastal areas of overlapping interest. However, during the second phase it is expected to be approached in a more detailed way through the collection of more accurate data, maps and information needed, as well as more public involvement, and the results of some task force actions.

Meanwhile, since the implementation of the proposed ICAM Planning Study is a multi-dimensional activity requiring a wide range of **tools, powers**, and a successful mixture of responsible agencies, control and market forces, it would be most appropriate to stress that efforts should commence towards introducing **supplemented market-based instruments** to the existing government-based "command and control" tool of implementation.

Finally, it would be useful to mention that **environmental aspects** have been the **focus motive** of the proposed alternative scenarios and of the selected one, for handling the coastal area's main problems and issues. The harmonic framework of this Mediterranean

NWG region of mixed land use types of development, demands an **urgent action** to implement, not only the main findings which can be in any case tested in practice, but also the components of the next phase of the ICAM Planning Study strategy, since the expectations are great and the future perspectives for the study area are very challenging.

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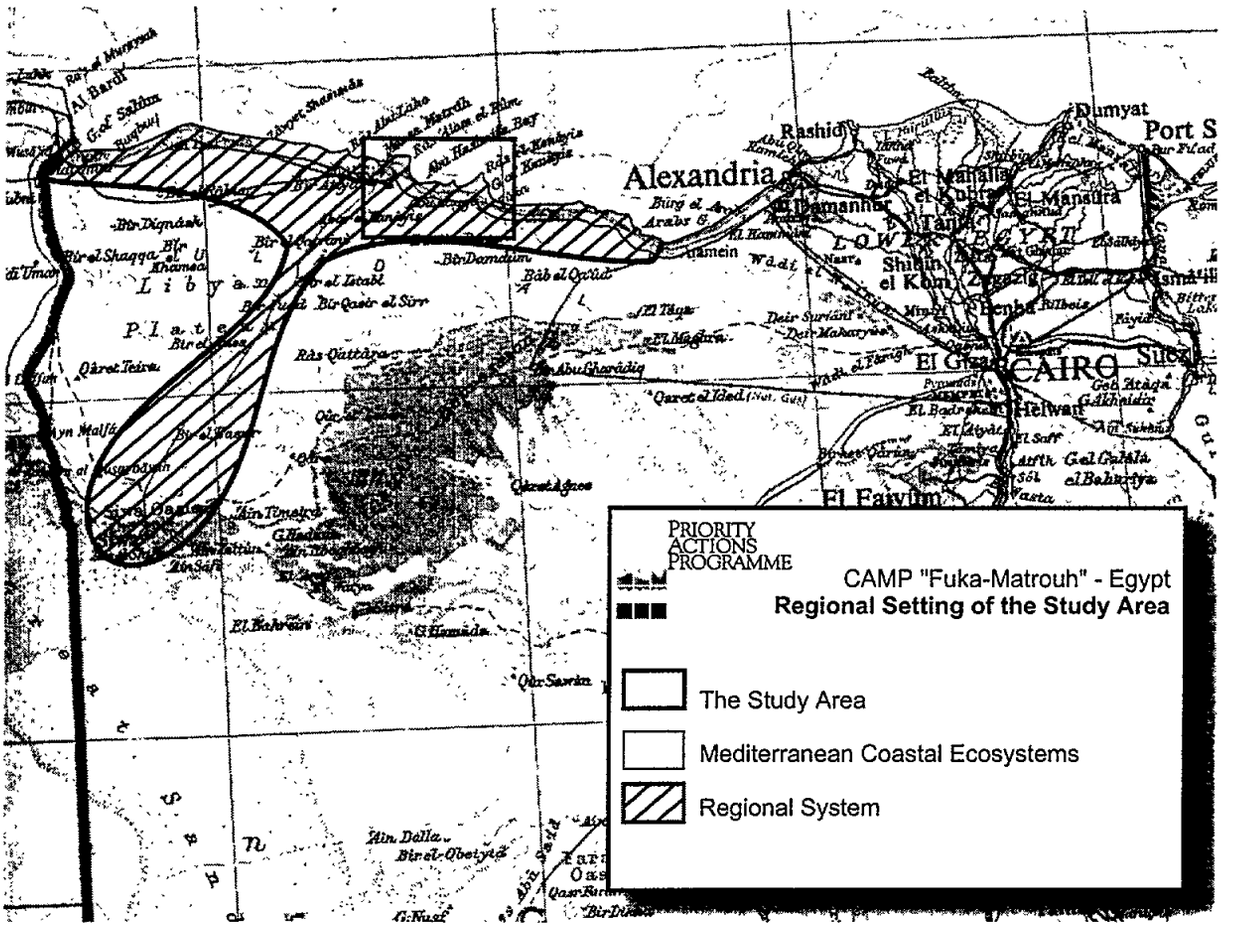
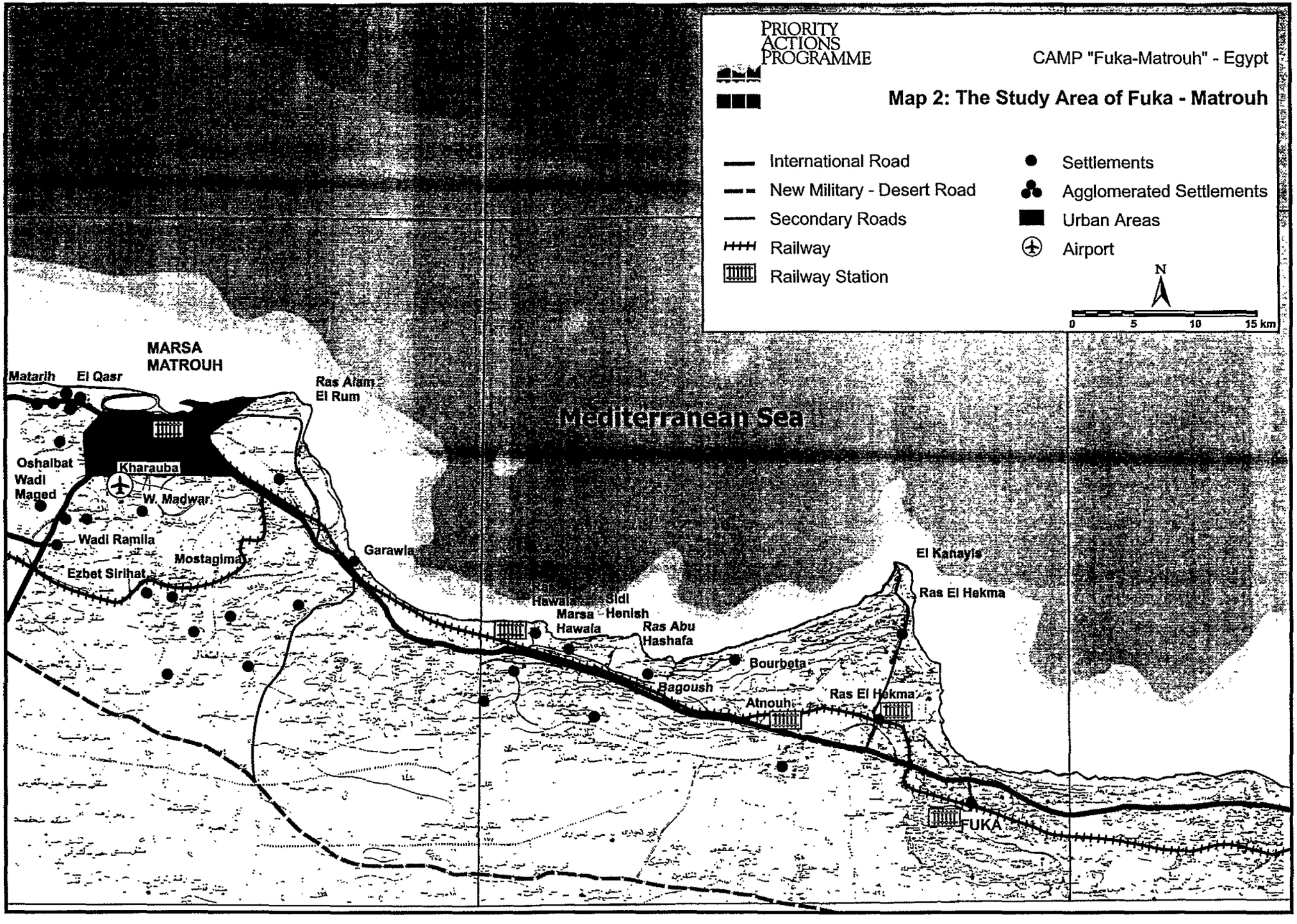
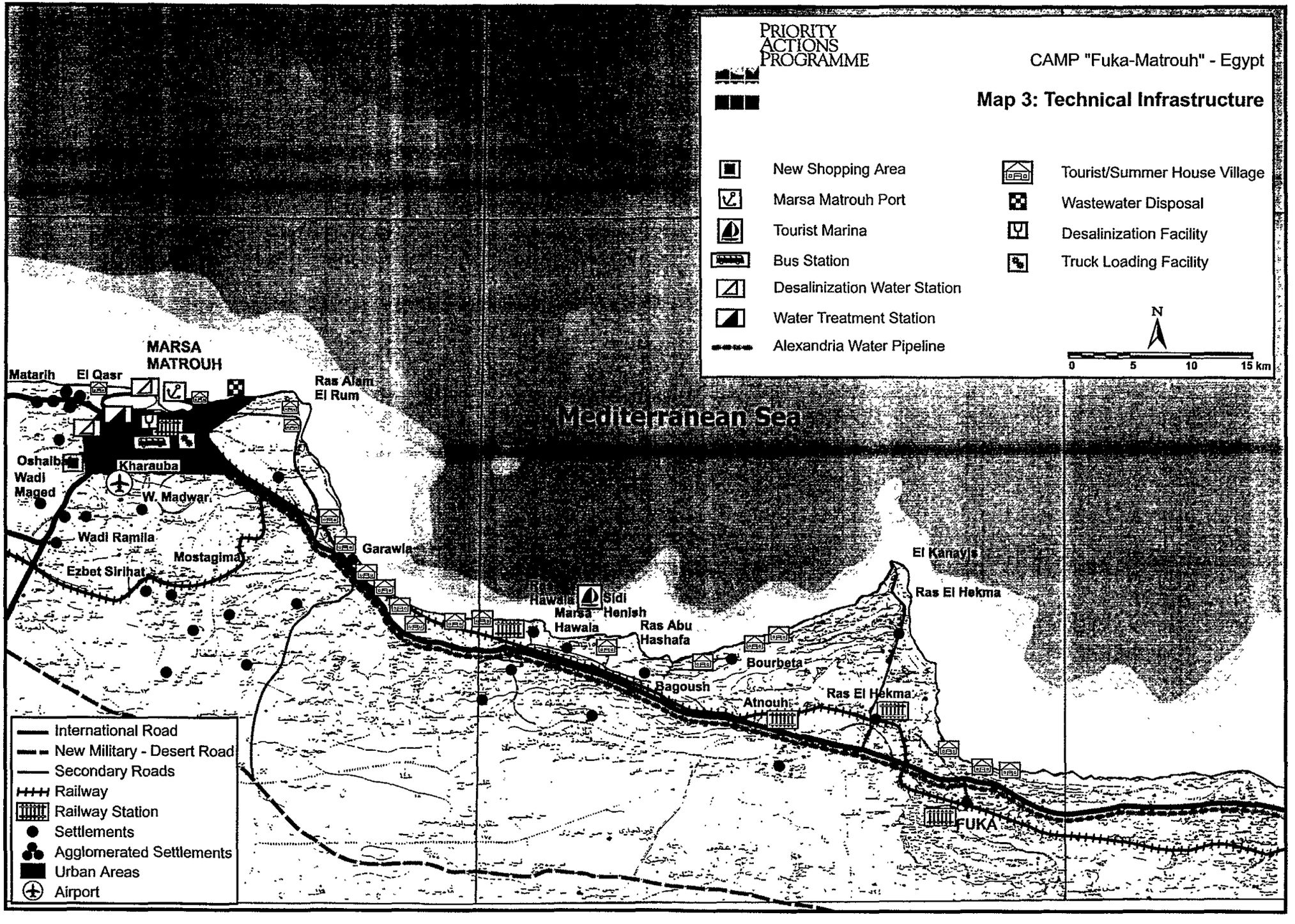
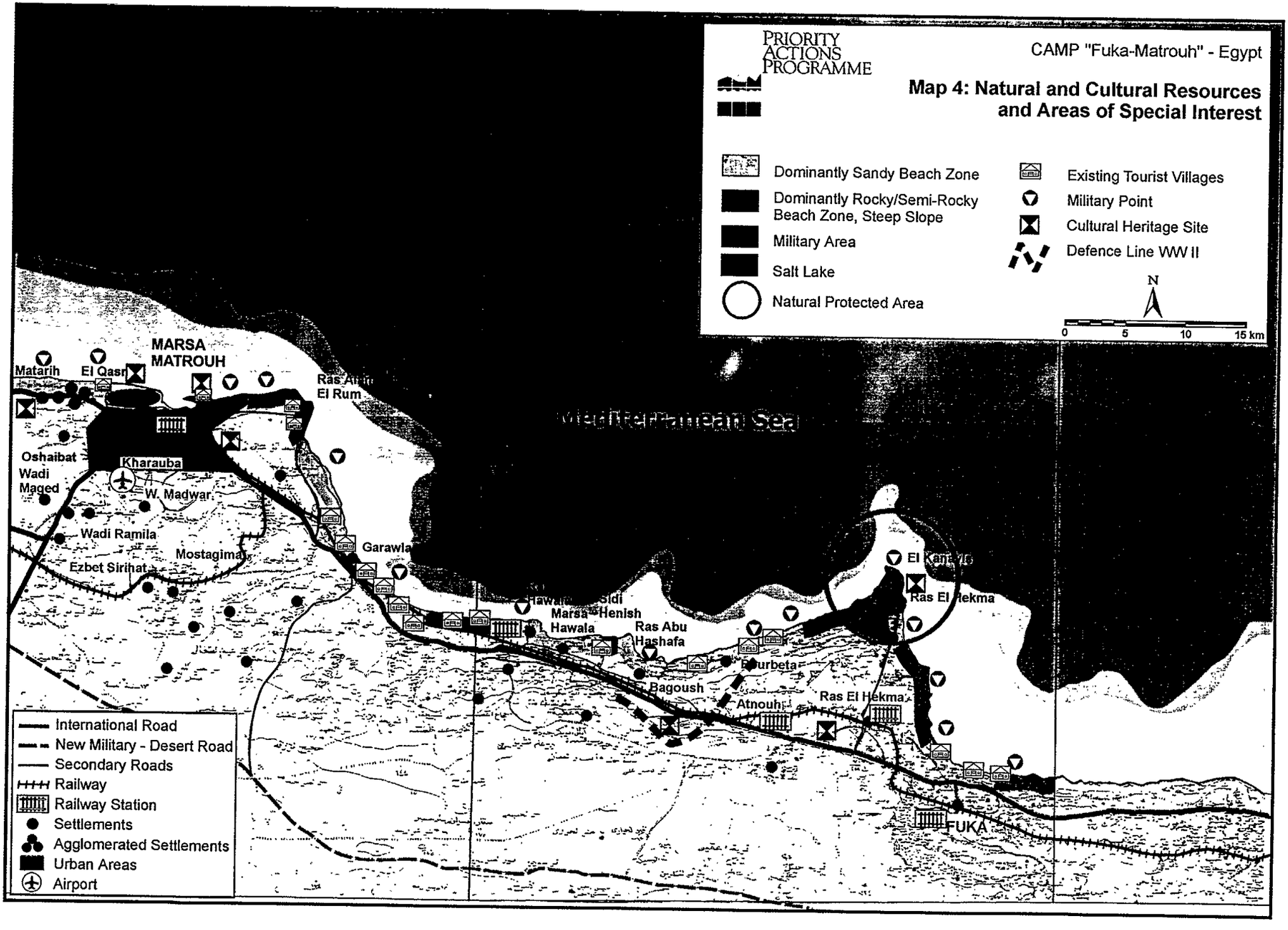
ANNEX: MAPS



Map 1: Regional Setting of the Study Area


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 2: The Study Area of Fuka - Matrouh
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Urban Areas
Airport
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
Oshaibat
Wadi Maged
Kharauba
W. Madwar
Wadi Ramla
Mostagima
Ezbet Sirihat
Garawla
El Kanayis
Ras El Hekma
Sidi Henish
Marsa Hawala
Hawala
Ras Abu Hashafa
Bourbeta
Bagoush
Atnouh
Ras El Hekma
FUKA


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 3: Technical Infrastructure
New Shopping Area
Marsa Matrouh Port
Tourist Marina
Bus Station
Desalinization Water Station
Water Treatment Station
Alexandria Water Pipeline
Tourist/Summer House Village
Wastewater Disposal
Desalinization Facility
Truck Loading Facility
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
Oshaib
Wadi Maged
Kharauba
W. Madwar
Wadi Ramla
Mostagima
Ezbet Sirihat
Garawla
Hawala Marsa
Sidi Henish
Hawala
Ras Abu Hashafa
El Kanayis
Ras El Hekma
Bourbeta
Bagoush
Atnouh
Ras El Hekma
FUKA
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Urban Areas
Airport


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 4: Natural and Cultural Resources and Areas of Special Interest
Dominantly Sandy Beach Zone
Dominantly Rocky/Semi-Rocky Beach Zone, Steep Slope
Military Area
Salt Lake
Natural Protected Area
Existing Tourist Villages
Military Point
Cultural Heritage Site
Defence Line WW II
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Al-Hikma
El Rum
Mediterranean Sea
Oshaibat
Wadi Maged
Kharauba
W. Madwar
Wadi Ramila
Ezbet Sirihat
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Garawla
El Kanayis
Ras El Hekma
Hawala
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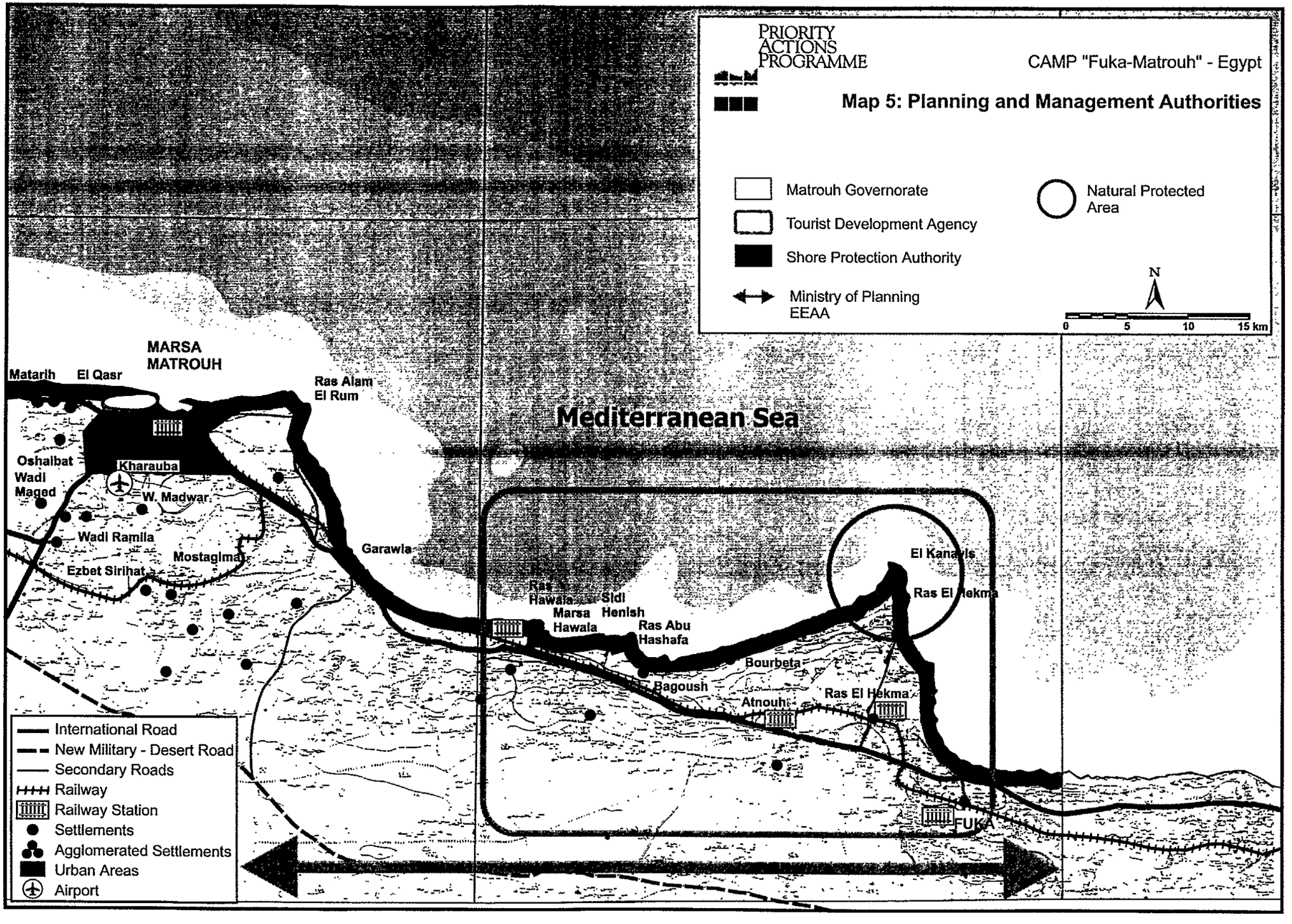
PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 5: Planning and Management Authorities
Matrouh Governorate
Tourist Development Agency
Shore Protection Authority
Ministry of Planning EEAA
Natural Protected Area
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
Oshalbat
Wadi Maged
Kharauba
W. Madwar
Wadi Ramila
Mostagimat
Ezbet Sirihat
Garawla
Ras Hawala
Sidi Henish
Marsa Hawala
Ras Abu Hashafa
El Kanayis
Ras El Hekma
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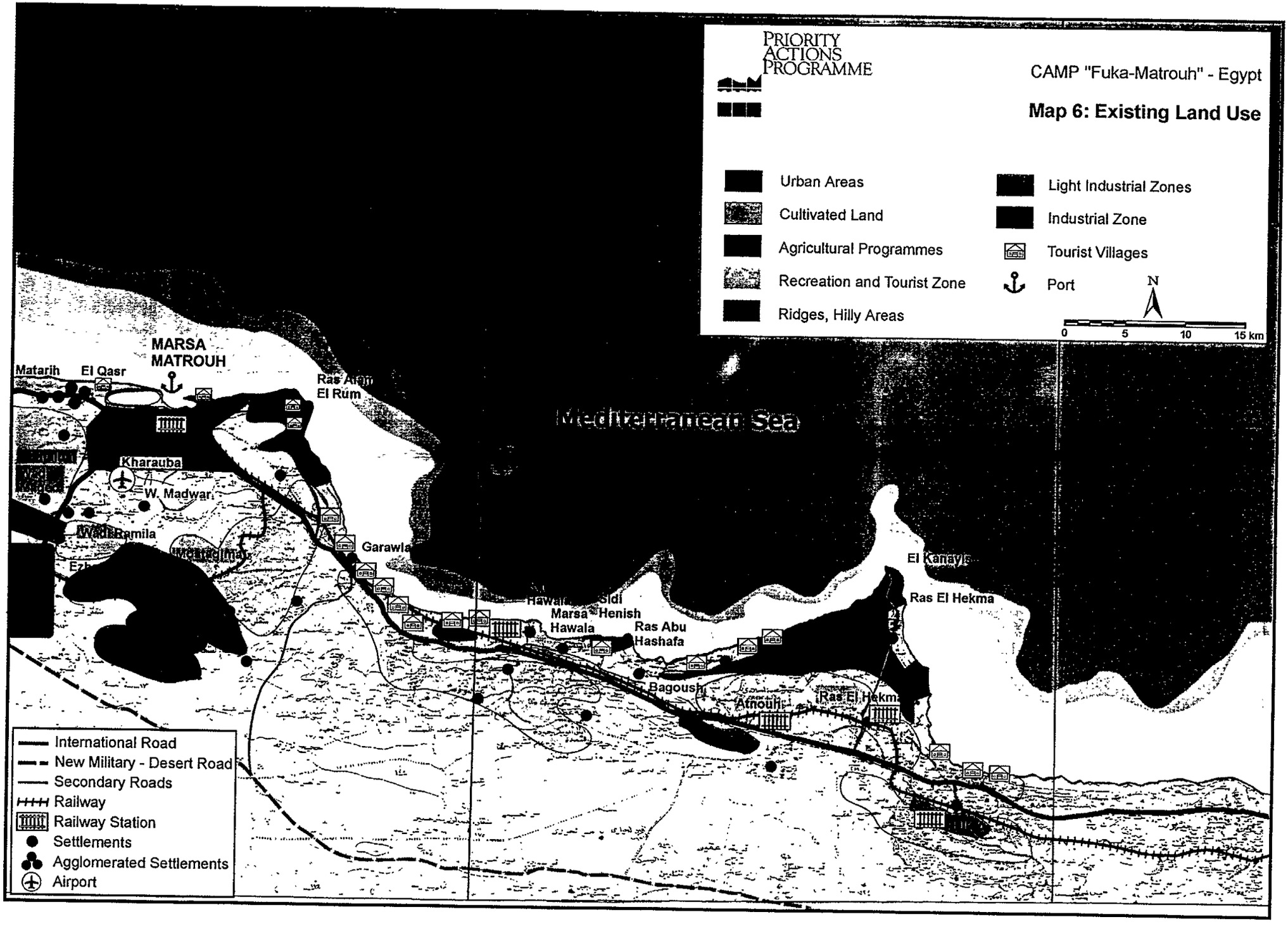
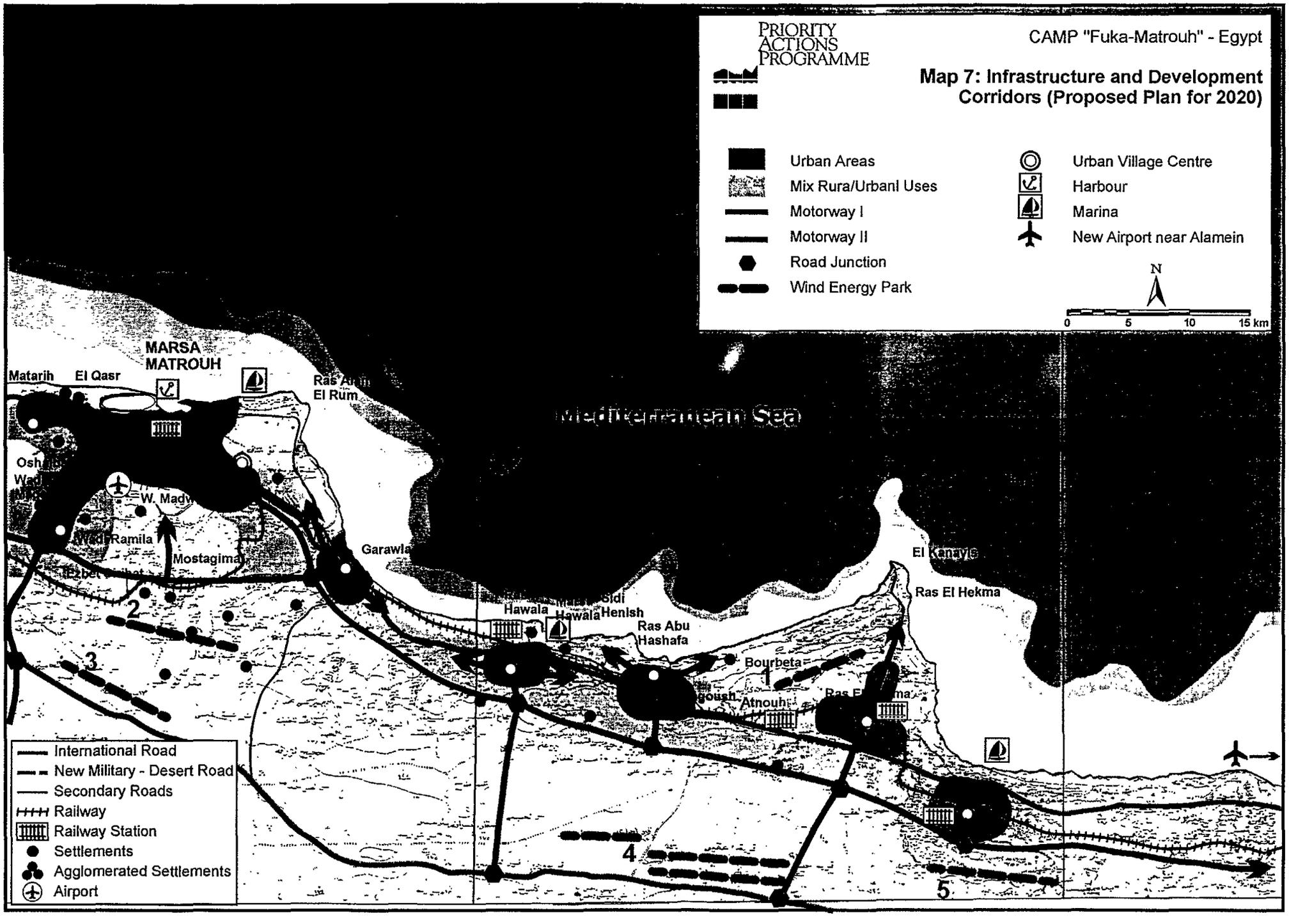
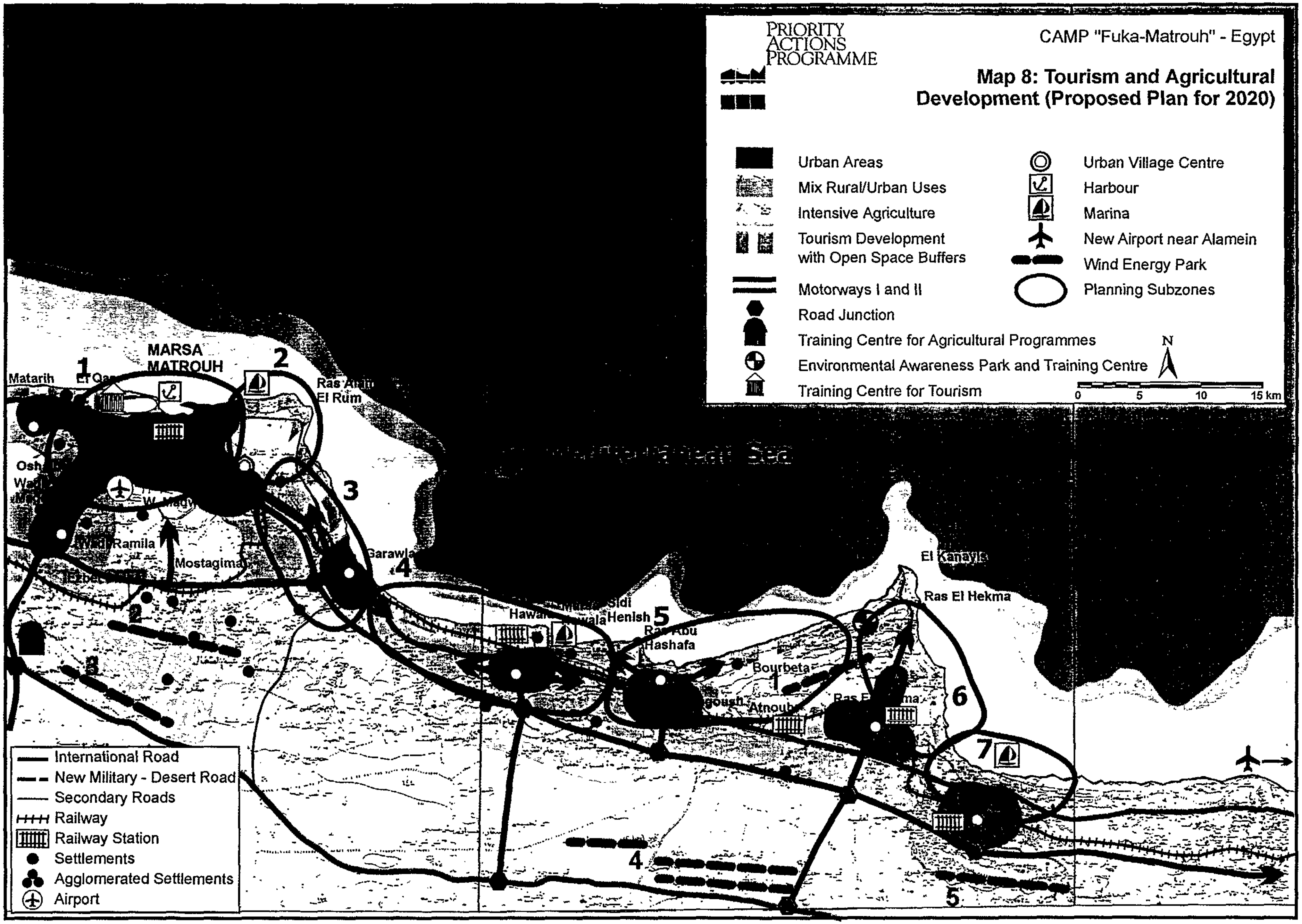
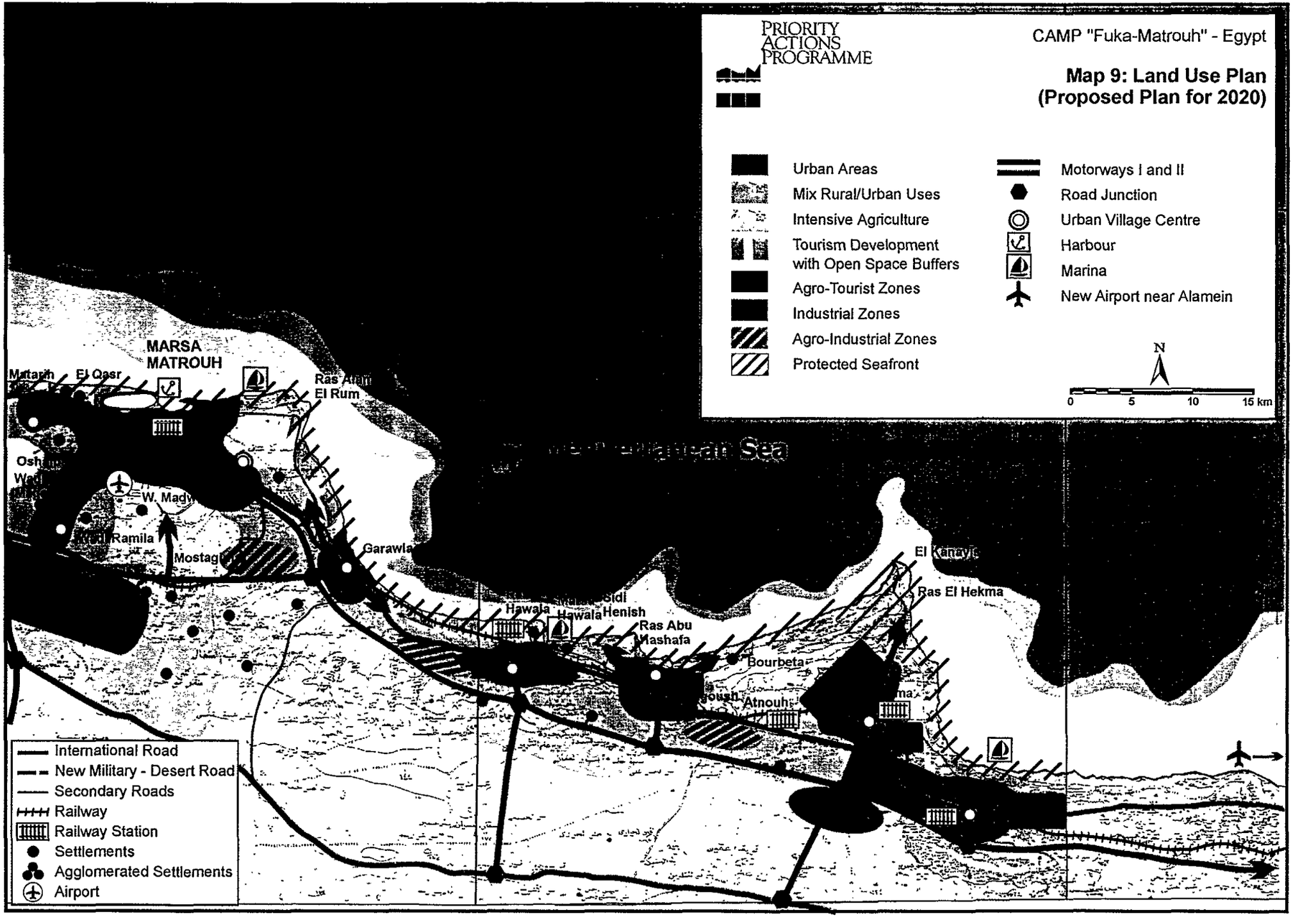
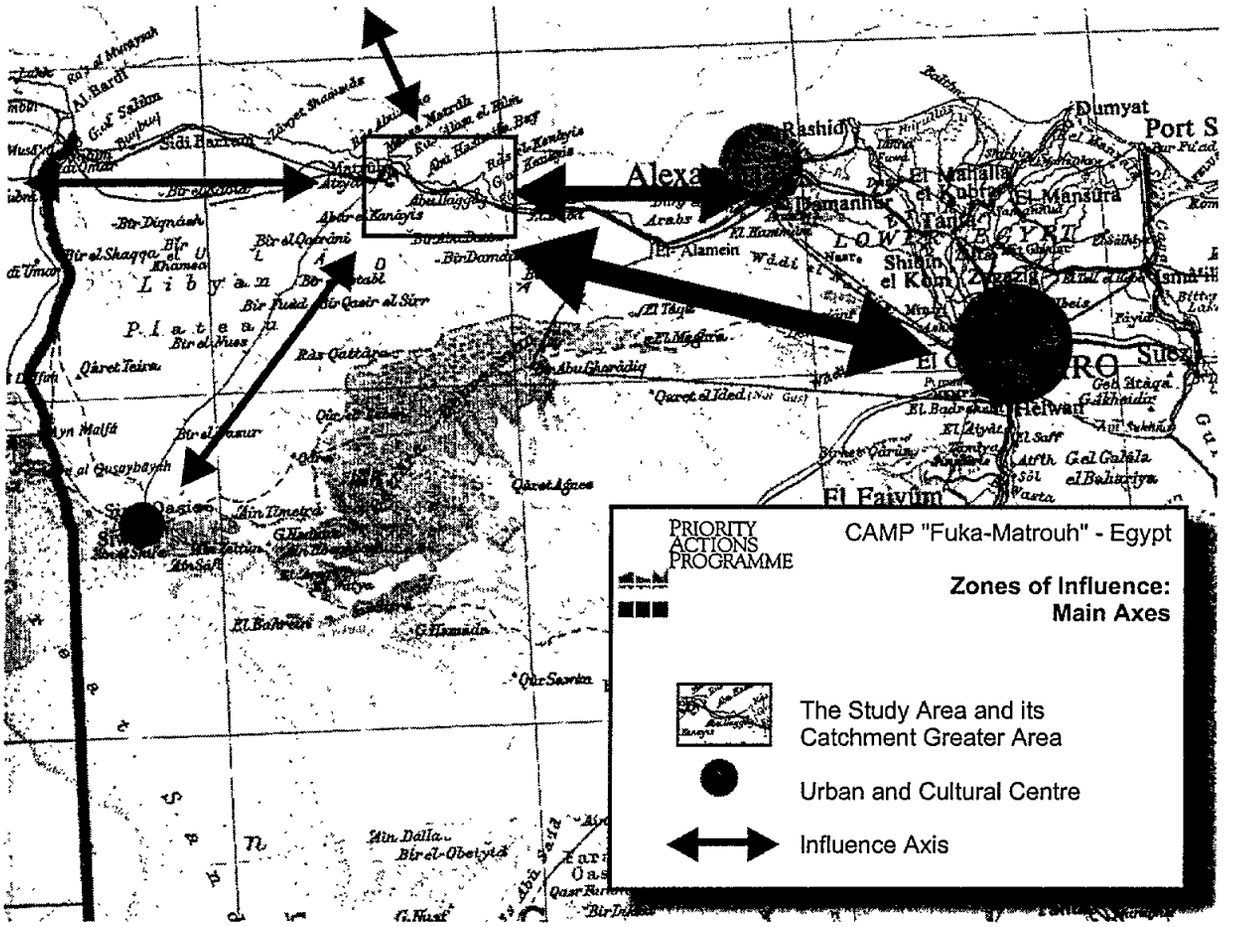

PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 6: Existing Land Use
Urban Areas
Cultivated Land
Agricultural Programmes
Recreation and Tourist Zone
Ridges, Hilly Areas
Light Industrial Zones
Industrial Zone
Tourist Villages
Port
N
0 5 10 15 km
Mediterranean Sea
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Kharauba
W. Madwar
Wadi Ramila
Garawla
El Kanayis
Ras El Hekma
Marsa Hawala
Sidi Henish
Ras Abu Hashafa
Bagoush
Atfouh
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport

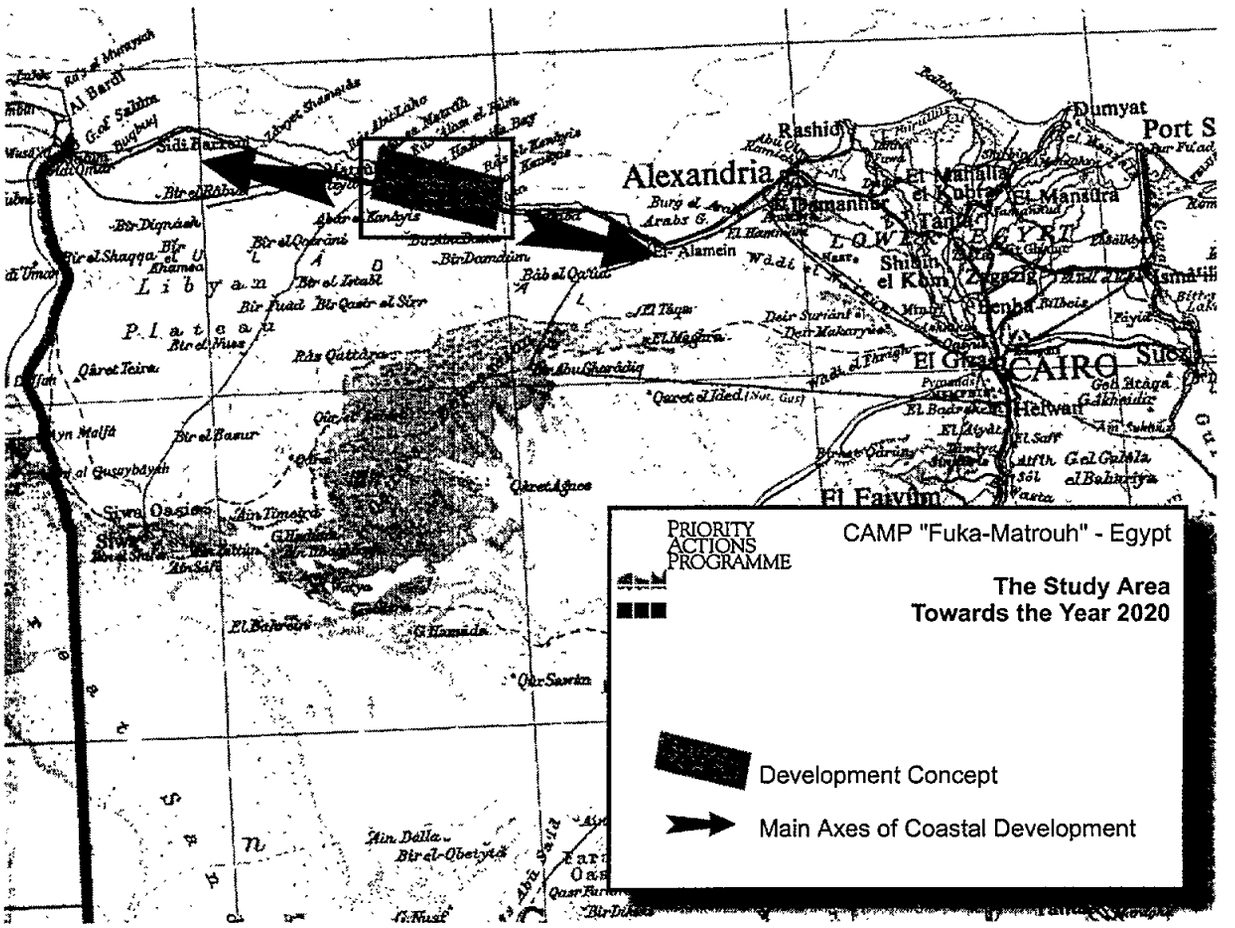

PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 7: Infrastructure and Development Corridors (Proposed Plan for 2020)
Urban Areas
Mix Rura/Urbanl Uses
Motorway I
Motorway II
Road Junction
Wind Energy Park
Urban Village Centre
Harbour
Marina
New Airport near Alamein
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Al
El Rum
Mediterranean Sea
Osh
Wad
W. Madv
Wadi Ramila
Mostagima
Garawla
El Kanayis
Ras El Hekma
Hawala
Hawala
Sidi Henish
Ras Abu Hashafa
Bourbeta
Atnouh
1
2
3
4
5
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 8: Tourism and Agricultural Development (Proposed Plan for 2020)
Urban Areas
Mix Rural/Urban Uses
Intensive Agriculture
Tourism Development with Open Space Buffers
Motorways I and II
Road Junction
Training Centre for Agricultural Programmes
Environmental Awareness Park and Training Centre
Training Centre for Tourism
Urban Village Centre
Harbour
Marina
New Airport near Alamein
Wind Energy Park
Planning Subzones
N
0
5
10
15 km
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport
MARSA MATROUH
Matarih
Ras Alam El Rum
Garawla
Mostagima
Ramila
Hawala
Sidi Henish
Ras Abu Hashafa
Bourbeta
Atnoub
El Kanayis
Ras El Hekma
1
2
3
4
5
6
7

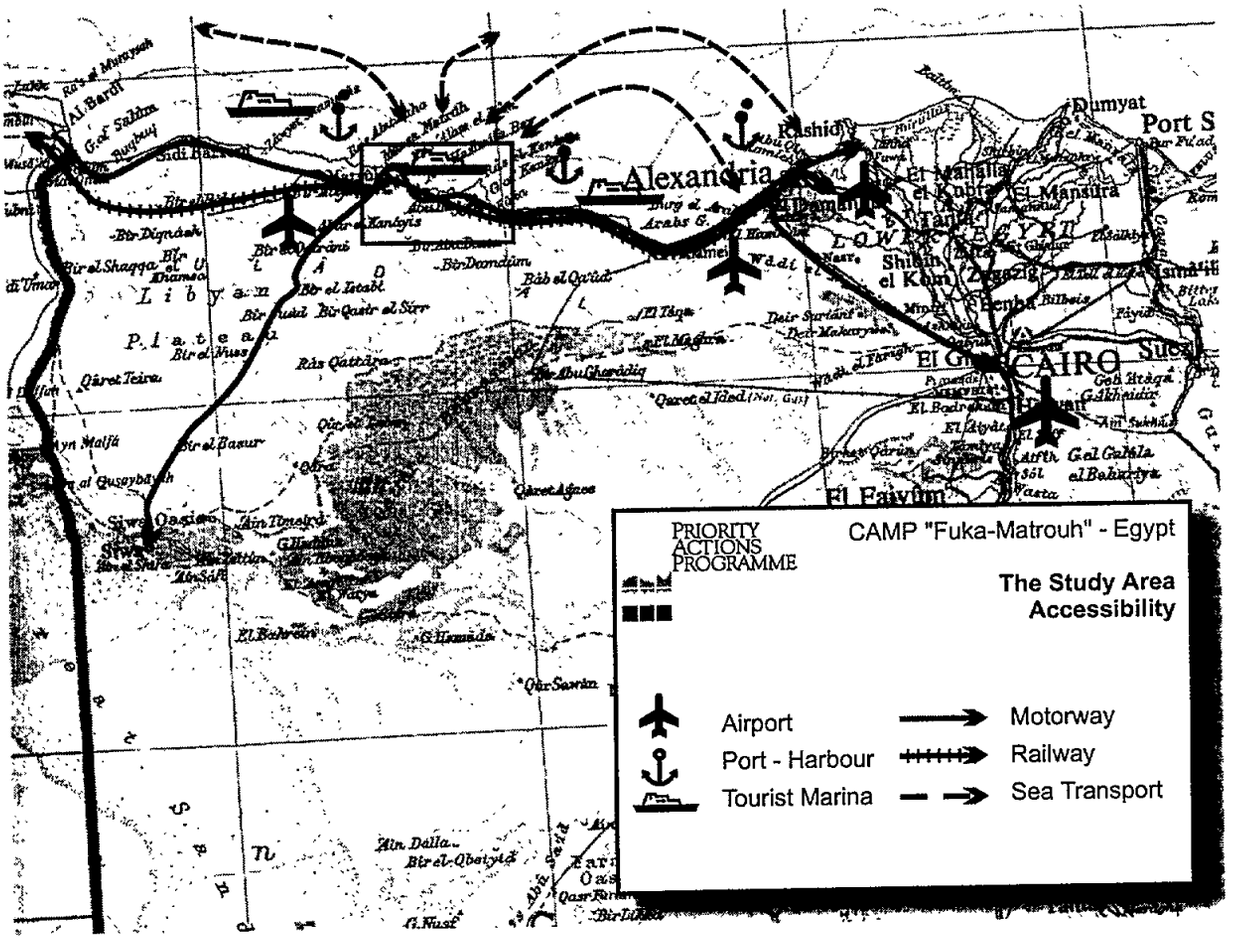

PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 9: Land Use Plan
(Proposed Plan for 2020)
Urban Areas
Mix Rural/Urban Uses
Intensive Agriculture
Tourism Development with Open Space Buffers
Agro-Tourist Zones
Industrial Zones
Agro-Industrial Zones
Protected Seafront
Motorways I and II
Road Junction
Urban Village Centre
Harbour
Marina
New Airport near Alamein
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
W. Madw
Ramila
Mostag
Garawla
El Kanayis
Ras El Hekma
Hawala
Sidi Henish
Ras Abu Mashafa
Bourbeta
Atnouh
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport



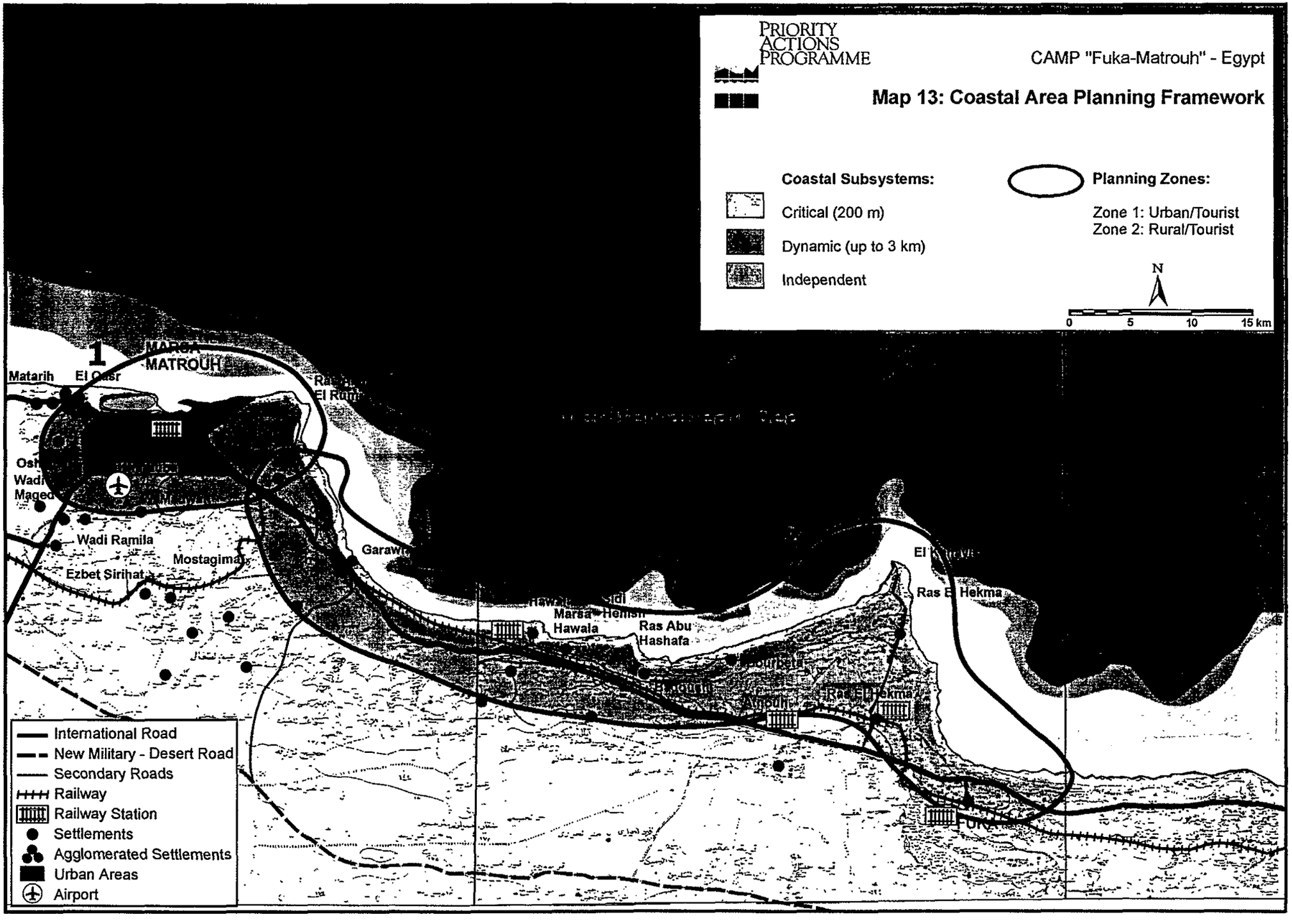
Map 10: Zones of Influence: Main Axes

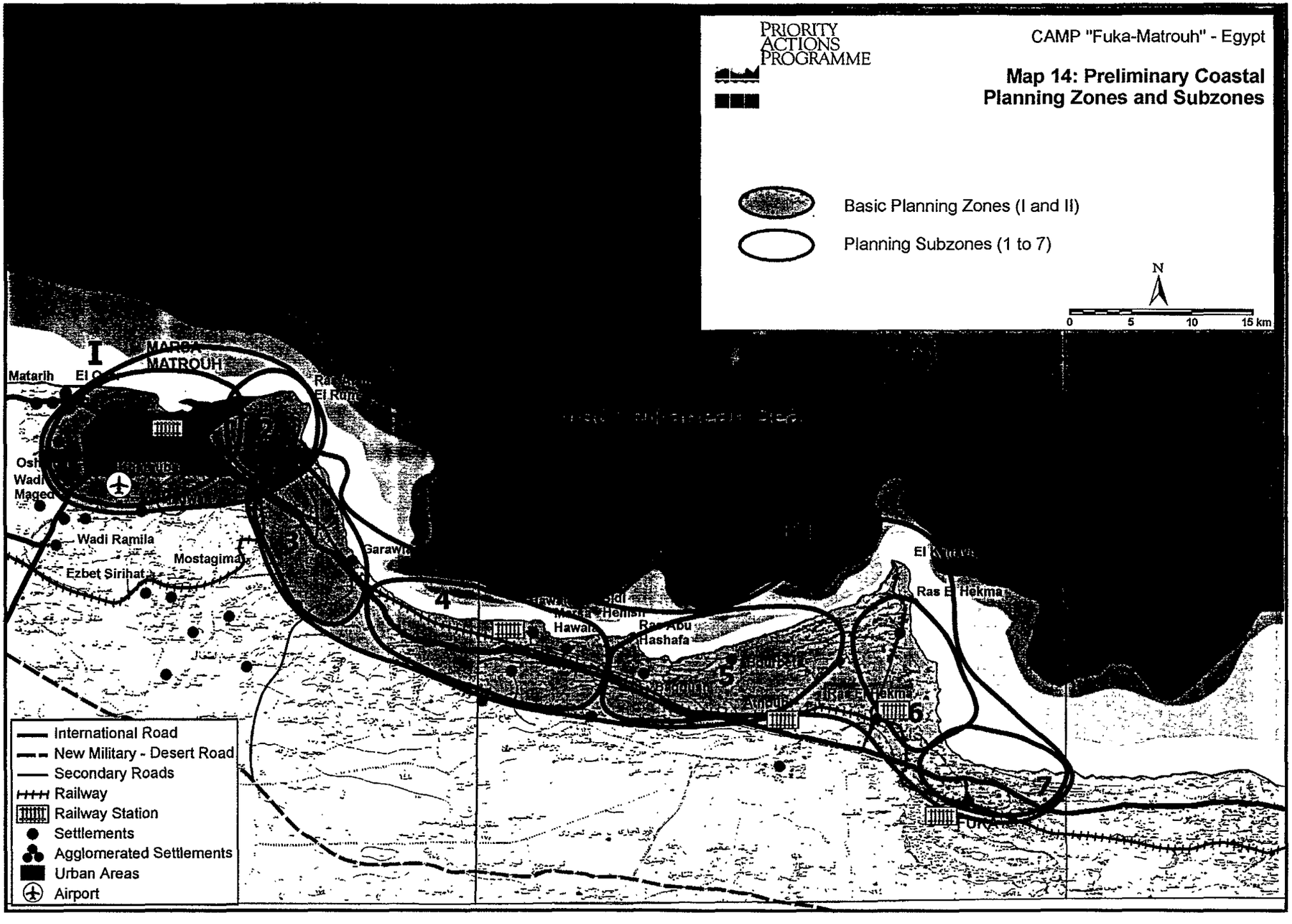


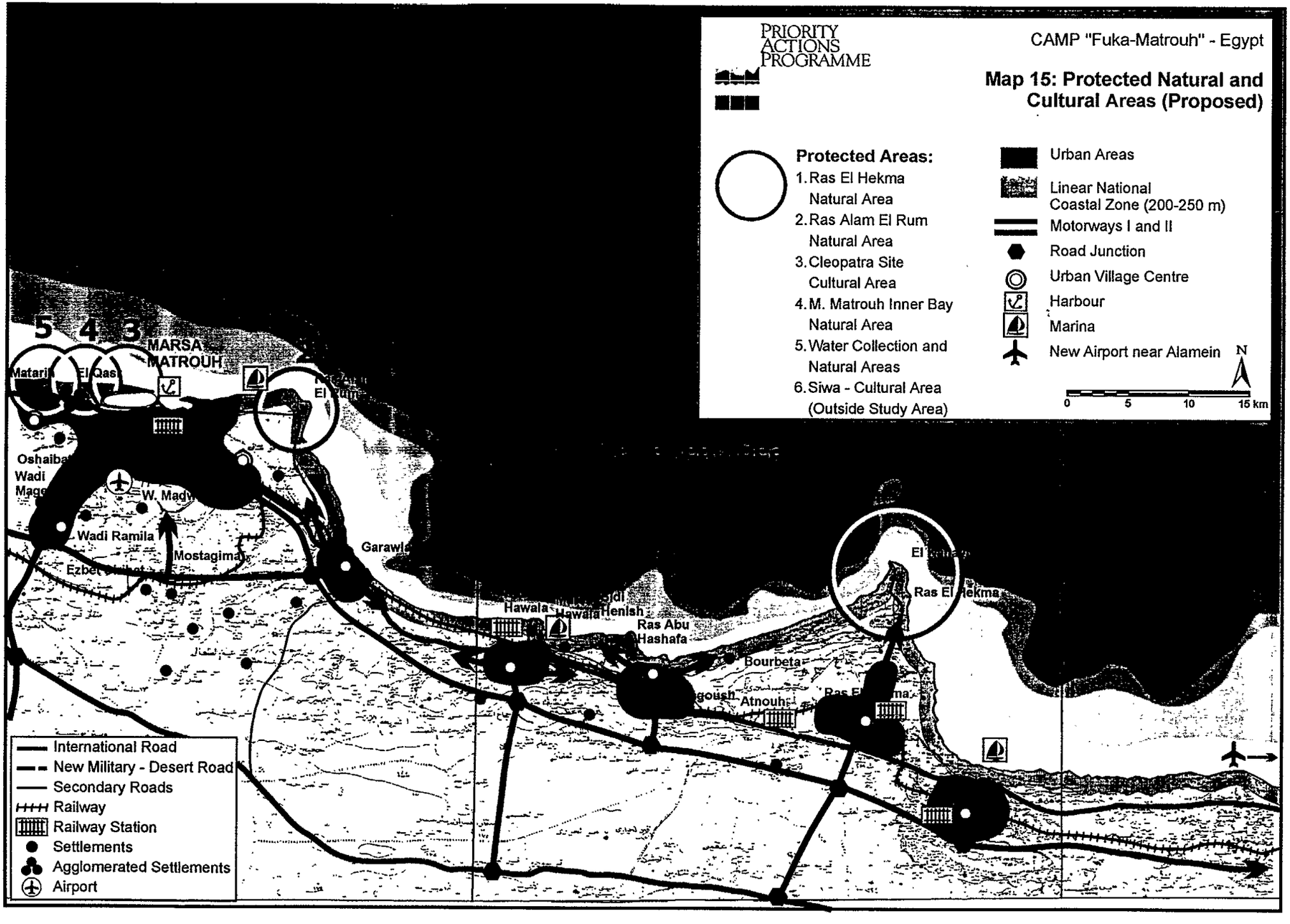
Map 11: The Study Area Towards the Year 2020



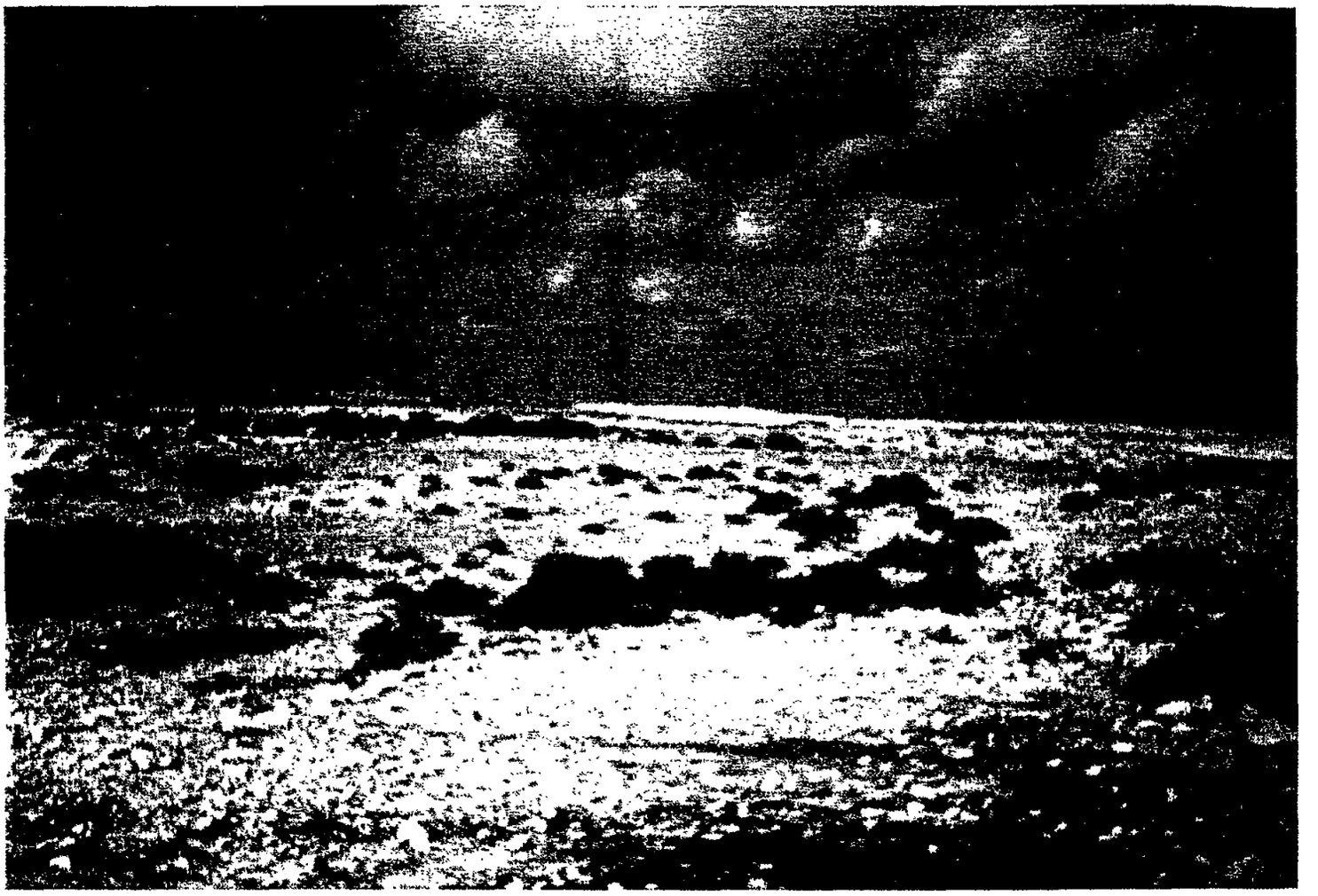
Map 12: The Study Area Accessibility


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 13: Coastal Area Planning Framework
Coastal Subsystems:
Critical (200 m)
Dynamic (up to 3 km)
Independent
Planning Zones:
Zone 1: Urban/Tourist
Zone 2: Rural/Tourist
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
El Rum
Wadi Ramila
Mostagima
Ezbet Sirihat
Garawla
Marsa Hemish
Hawala
Ras Abu Hashafa
Ras El Hekma
Ajnouh
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Urban Areas
Airport


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 14: Preliminary Coastal Planning Zones and Subzones
Basic Planning Zones (I and II)
Planning Subzones (1 to 7)
N
0 5 10 15 km
I
II
1
2
3
4
5
6
7
MARSA MATROUH
Matarih
Wadi Ramila
Mostagima
Ezbet Sirihat
Garawla
Hawata
Hashafa
Ras El Hekma
Fuka
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Urban Areas
Airport


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Map 15: Protected Natural and Cultural Areas (Proposed)
Protected Areas:
1. Ras El Hekma Natural Area
2. Ras Alam El Rum Natural Area
3. Cleopatra Site Cultural Area
4. M. Matrouh Inner Bay Natural Area
5. Water Collection and Natural Areas
6. Siwa - Cultural Area (Outside Study Area)
Urban Areas
Linear National Coastal Zone (200-250 m)
Motorways I and II
Road Junction
Urban Village Centre
Harbour
Marina
New Airport near Alamein
N
0 5 10 15 km
5 4 3
MARSA MATROUH
Matarij
El Qas
Oshaiba
Wadi Magg
W. Madv
Wadi Ramila
Mostagima
Ezbet
Garawla
Hawala
Henish
Ras Abu Hashafa
Bourbeta
Atnouh
Ras El Hekma
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport

Strategic Environmental Assessment of the Integrated Coastal Area Management Plan of Fuka-Matrouh Area, Egypt



1999

Alexandria University

Strategic Environmental Assessment of the Integrated Coastal Area Management Plan of Fuka- Matrouh Area, Egypt

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Final Report
May 1999

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Acronyms

ECEPP	Energy Conservation and Environmental Protection Program
EIA	Environmental Impact Assessment
GIS	Geographic Information System
HUD	US Department of Housing and Urban Development
ICAM	Integrated Coastal Area Management
MAP	Mediterranean Action Plan
MARPOL	Mediterranean Agreement for Reduce the Pollution of Oil
NGO	Non Governmental Organizations
PAP/RAC	Priority Action Program at the Regional Activity Center
PPP	Policy, Plan and/or Program
SEA	Strategic Environmental Assessment
UNDP	United Nations Development Program

Executive Summary

EIA is defined as the process of predicting and evaluating an action's impacts on the environment, the conclusions to be used as a tool in decision making (Therivel et. al., 1992). However, SEA has been described as the process of anticipating and addressing potential environmental consequences of proposed initiatives at higher levels of decision making (Sadler, 1995; Sadler and Verheem, 1996).

There is no overlapping between these two concepts, because both EIA and SEA have different objective and deal with different levels. EIA aims to prevent environmental degradation by giving decision-makers better information about the consequences that a development action could have on the environment. SEA aims at integrating environmental considerations into the earliest phase of policy, plan and/or program (PPP) development, on a par with economic and social considerations (Saul et. al., 1995). By assessing the strengths, weaknesses and environmental resources, which can support development; this approach may promote sustainable development.

Study Area Description:

Fuka – Matrouh area, the study area, is located in the middle upper portion of Matrouh Governorate, This area is rectangular in shape and extends along the Mediterranean Sea for about 60 km from Ras El-Dabaa to the east (longitude 28 25` E) to Ras El-Hekma (sometimes called Ras El-Kanaias) to the west (longitude 27 50` E). The area is rather narrow in width as it extends for about 30 km from the shoreline (latitude 31 05` N) to the elevated structural plateau (latitude 30 15` N). Alexandria is about 210 km east of study area and Marsa Matrouh City is about 70 km to the west.

Integrated Coastal Area Management:

Under conditions of study area nature and limiting factors (water, energy, rare and endangered species, ...), an integrated coastal area management plane was designed. Of the most important plans, which should be implemented immediately is the socioeconomic awareness program. This is actually because it is prerequisite to any development program. It takes relatively longer time to have an outcome, and it is useful and pays back whether we have other programs in operation or not.

Programs of water supply, institutional capacity building and land use planning

together with preservation of cultural and ecological sites must be developed concurrently in an integrated fashion. Failure of having concurrent development of these programs may present serious threat to the sustainable development due to over exploitation of shortsighted private investors.

The development of self-supporting activities as well as the tourism national and international marketing plans would start once the infrastructure has been completed.

Identification of Effects and Impacts of Implementing the ICAM:

There are many methods for identifying environmental effects and impacts e.g. Overlay method, Checklist method, Matrices method, and Network (sometimes known as flow diagrams) method. This chapter includes two main sections. The first section to describe the matrix method, and the second to environmental analysis of this matrix.

The matrix method is one of the widest methods used in Strategic Environmental Assessment (SEA). This method is useful for the identification of possible impacts and evaluating impacts on environmental elements. It correlates cause-effect relationships between specific project activities and impacts, Matrices typically employ a list of human actions in addition to a list of impact indicators.

Results indicate that the most significant positive impacts are due to the development of transportation system (airport and network) upgrading awareness and better employment of local people are considered significant positive impacts.

The most important negative impacts may be attributed to pollution due to tourism and associated waste.

Alternatives of Suggested Activities:

The alternatives for actions in the study area are very limited. For example; the airport as a project has no alternatives in our case. The governorate has already approved its location and size. The construction of this airport is in progress. Upgrading of railway and roads is also in progress. There are no alternatives of significant importance, to these services development.

Suitability analysis based on GIS; associated with integrated coastal area management, can enhance a comprehensive vision of development in the study area. This vision must be taken into consideration when we attempt to deal, in some details,

with development of this area, which is not the case with SEA.

Mitigation Measures:

1. Tree plantation to protect against wind storms and air pollution from traffic
2. Wastewater recycling units for each resort
3. Cultivation in the hinterland to reduce transportation of goods in the summer and reduce pollution
4. Minimizing quarrying to reduce pollution and protect hinterland from wind action

Contents:

Chapter I
Introduction

The need for Strategic Environmental Assessment (SEA) has arisen from the project-specific nature of Environmental Impact Assessment (EIA) and awareness that environmental issues must be addressed in the process of policy and plan making. These issues have been recognized internationally and are not unique to Egypt.

EIA is defined as the process of predicting and evaluating an action's impacts on the environment, the conclusions to be used as a tool in decision making (Therivel et. al., 1992). However, SEA has been described as the process of anticipating and addressing potential environmental consequences of proposed initiatives at higher levels of decision making (Sadler, 1995; Sadler and Verheem, 1996).

There is no overlapping between these two concepts, because both EIA and SEA have different objective and deal with different levels. EIA aims to prevent environmental degradation by giving decision-makers better information about the consequences that a development action could have on the environment. SEA aims at integrating environmental considerations into the earliest phase of policy, plan and/or program (PPP) development, on parallel to economic and social considerations (Saul et. al., 1995). By assessing the strengths, weaknesses and environmental resources, which can support development; this approach may promote sustainable development.

1.1 Objectives

Work aims to assess from a strategic perspective, the environmental impact of the proposed integrated coastal area management plan of Fuka - Matrouh . In order to attain this objective a number of activities were carried out by the team. These are :

1- Identification of effects and impacts of implementing the proposed integrated coastal area management plan;
2- Identification of alternatives; and
3- Studying mitigation measurements for the proposed actions.

1.2 Methodology

There are few officially acknowledged methodologies for SEA. *The United States Department of Housing and Urban Development (HUD)* has produced a formal SEA manual, which gives clear step-by-step instructions for carrying out an area wide environmental appraisal. This methodology is shown in Figure.1 (HUD, 1981; UNDP, 1992) show the various steps of SEA as follows:

1- Determining the need for SEA;

2- Establishing a work program;

3- Determining the objective(s) of policy, plan and/or program (PPP);

4- Defining the scope of the SEA;

5- Environmental analysis;

6- Establishing environmental databases;

7- Impact evaluation and synthesis;

8- Proposing recommendations and preparing an SAE report;

9- Monitoring and feedback.

It should be mentioned that the steps of this methodology do not have to be undertaken in sequential order. Although a step-by-step methodology is proposed these steps do not necessarily occur in strict sequential order. Furthermore, the steps represent iterative process, requiring comments from the public and feedback into the process.

1.3 EIA and Project Planning

Integration of the EIA and SEA with the project cycle is essential to any project planning exercise. Since EIA can have a real effect on a project's design, implementation, and/or costs, it should be fully incorporated in the project planning process. Only this way that EIA can become an effective instrument for protecting the environment and ensuring sustainable economic development.

For new projects, the EIA should be applied to all proposed actions. An EIA is not concerned with analyzing the extent of the existing pollution problem. It will, however, include evaluation of any available baseline data and, in the absence of

Figure 1

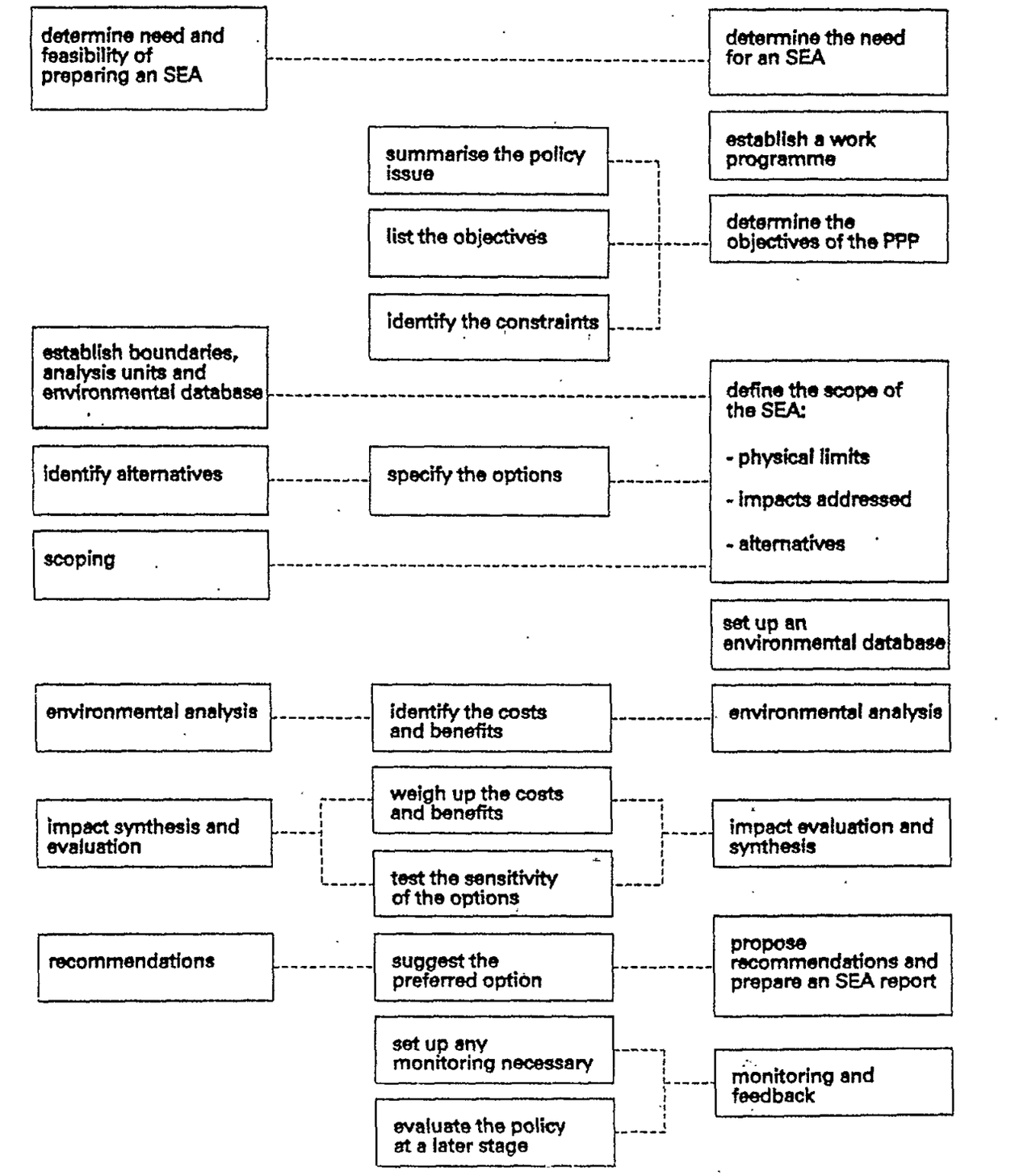


Figure. 1 Steps in SEA methodology (HUD,1981)

information in quantitative terms, will make predictions on the basis of available qualitative indicators.

At the permissibility stage of the project planning cycle, detailed project design is in general not available but the basic nature of the project is known. At this stage the project is based on the selection of technology and identification of main environmental areas of concern associated with the project. Even without detailed project information it is possible to identify likely significant impacts with enough certainty to be able to decide whether a full EIA would be required.

At the feasibility stage of the project cycle, an EIA can provide timely inputs for the economic, technical, and design tasks related to the project. If an EIA is 'added-on' once the design has been finalized and major environmental problems have been identified, it may become time-consuming and expensive to integrate mitigation measures into the final design.

The process of deciding on the impacts to be investigated in detail is called ***scoping*** and it is seen as an important initial activity in any EIA. Scoping can be undertaken in a number of ways, but it is important to open it up to a number of role-players in the project, thereby reducing the likelihood of criticism of the EIA at a later date for omitting matters of public concern. Such criticism coming later may increase future costs of mitigation. At times local communities are also involved in the scoping to provide an opportunity to convey to the public the benefits of the proposed project. Contributors to scoping should typically include project proponents; government representatives from the environment and agencies relevant to the project; reviewing agency; NGOs; and representatives from local communities. Scoping is an issue-oriented activity and its output needs to be made precise with specific impacts identified.

Chapter II
Integrated coastal Area Management Plan of Fuka – Matrouh

This chapter is intended to provide a brief summary of the various aspects of ICAM plan of Fuka-Matrouh. It begins by providing a description of the study area capabilities, as background, before discussing various aspects of the ICAM plan.

2.1 Potential Opportunities for Development of the Area:

2.1.1- Natural attractions: A remarkable feature of the shoreline is the succession of bays, the first of which begins east of Matrouh City and extends to Alamein City. Due to the above features, the area is distinguished from other coastal areas. The coastal capes are formed by rocky projections. The most remarkable of them is Ras El-Hekma with its elaborate location, overlooking Hekma bay to the east and Abu Hashfa bay to the west. Abu Hashfa bay contains Ras Hawala, where beaches are superb for tourism (El-Bastawissi, 1989).

Overall, tourism trends in the project area can be summarized as follows: about *85%* can be defined as the sun-and-beach tourism (coastal belt), cultural and health-and-recreation tourism (Siwa 10%) and finally, business and transit tourism (Marsa Matrouh 5%).

2.1.2- Cultural heritage:

The nearest major culture heritage site east of the area is found at the Marina/Alamein some 190-km, from Marsa Matrouh and is still being excavated as it comes under extremely heavy tourist development pressure on all sides. The framework of this project area takes us as east, as the international heritage site of Abu Mena, and as south as the temple of Jupiter Amun in the Oasis of Amun-Siwa, and as west as the site of Zawiat Al-Agdab near Salum.

In Mediterranean context, however, the site of "Abu Mena" cannot be ignored or even overlooked; as it eminently appears both on the World Heritage List and the list of "100 historic sites of common Mediterranean interest" (e.g. El-Raey et. al, 1998). Other major sites east of Matrouh include:

1. *Abu Seir,* some 50 km out of Alexandria, includes many of ancient Egyptian, Roman, and Coptic monuments. Excavations are also currently underway in search of Roman monuments.
2. *Marinul El-Alamein-* the ancient " Leokathbes "about 100 km out of Alexandria. It is a Roman settlement, still being excavated.
3. Some interesting archaeological sites to the west of Matrouh like:

   a- Cleopatra Site: 15 km west of Matrouh, including Cleopatra's Bath and the famous Cleopatra's Rock.

   b- Agiba Site: at Um Al-Rakhm- about 30 km west of Matrouh, including Roman catacombs. The site is still being excavated.

4. Some of interesting archaeological sites to the south of Matrouh like the Oasis of Siwa. Siwa includes the Temple of Jupiter Amun (temple of secrets), the temple of Nectanebo II and Gabal Al-Mawta (Mountain of the Dead).
5. The other compelling example, with vast capacity for comprehensive development potentials, is that of the World- and Regional- Heritage *Site of Abu Mena,* which lends itself readily to fill restoration of function (if not also of form). Whereby, it can recover its past glory as a pilgrimage center of great popularity and attraction throughout the Mediterranean region.

2.1.3- Economic resources base for industry:

The raw materials, which are available in the region, provided the support to organic and inorganic chemical processes. These industries are very important because they can act as a nucleus, attracting other industries. The number of possible downstream operations based on both the organic and inorganic chemical complexes is very large. The choice of products, which should be manufactured in the future, will depend on the marketing opportunities and the technical knowledge available by that time; both change rapidly. It is, therefore, premature to enumerate the possibilities.

2.1.4- Socioeconomic Potentials:

These include:

- It is likely that members of a single family would be willing to cooperate in communal development;
- The dominance of extended families living together as a community is an asset implementation, particularly of model trials and action area projects where the

target community would belong to a single family;

- The project has soils, which are likely to be suitable for the development of environmentally suitable and cost-efficient construction materials with very little processing;
- Income of needy families could be supplemented by agro-processing and traditional handicrafts, which are usually made by women;
- Older women have more mobility and decision-making privileges. They, rather than younger women could be better targets for training.

2.2 Limiting factors:

2.2.1- Water:

Three possible sources of water are available: surface water, groundwater and water from other facilities:

- *Surface water:* The surface water in the area is very limited in magnitude as it originates from the rainfall of the winter season. Most water harvests are concentrated in northern part. Runoff is possible after rather heavy rains, and a considerable amount of water may percolate to deeper soil layers. The main elements for water balance of the project area is rainfall as input and evaporation, runoff recharge to groundwater and change to soil moisture storage as output.
- *Groundwater:* The main groundwater source is the Nubian sandstone aquifer, it extends to the north of Qattara Depression. In Fuka region, there is also a trapped groundwater aquifer from which water is extracted through hand dug or drilled wells, and is used for irrigation of orchards. A minimum safe yield from Fuka aquifer is estimated to be 5,000 m^3/day. Salinity is low and ranges from 2000 to 3000 PPM. The groundwater suitable for agricultural and domestic uses occurs in relatively shallow non-artesian aquifers or in small shallow semi-perched aquifers with slight artesian pressure. The non-artesian aquifers in the coastal plain found in near land surface, are recharged directly by rainfall and the infiltration of surface runoff. The quality of the water in the several aquifers in the area varies widely according to seasons. The best quality is found in winter and the worst in autumn. Also the water contains about 20,000 ppm of solid matters, which reduces water quality.

- *Other Water Facilities:* Currently, an estimated 434,700 *m3* per month of water in winter and *453,300 m3* per month in summer is supplied to the Governorate via the pipeline system, train and desalination plants for areas west of and including El- Alamein (USAID, 1988). While the rural population relies mainly on cisterns for drinking and on galleries for washing, the water resource for the main population centers come from outside. Extensions of a pipeline from Alexandria supplies public water to Ras El-Hekma (Ayyad, 1995).
- *Sewage Collection and Treatment:* Vacation complexes along the coastline do not have any sewage systems or treatment plants. Sewage is collected in septic tanks and it percolates though sand and likely to reach the beach. Septic tanks are used in Marsa Matrouh, too. The waste water for the population in towns is discharged directly into creeks and practice no sanitary sewage disposal except a few who have private separate units (El- Naggar et al, 1988)

2.2.2- Energy:

The power plants in Marsa Matrouh produce 60 MW, only 20% of which is being utilized. The cables are in a poor condition and cause frequent electricity cut-off, but there is a plan to replace the present cables. Since there are no central transformer in the town, each building complex has to install its own transformer. In 1996 the whole system has been connected to the interconnected network. The national authorities provide power supply system services of the project area. However, all farmers rank shrubs and wood as the primary sources of fuel for cooking and heating. Kerosene is ranked as a secondary source. However, the use of shrubs for cooking and heating contributes to the devastation of the natural vegetative cover, which in turn leads to soil erosion.

2.2.3- Road Network and Transportation:

Local tourists (90% of the tourists received by Marsa Matrouh) arrive to the area by railroad or by the main highway. International tourists arrive by flights via Alexandria or Cairo. If the area is to be developed for international tourism, technical conditions of Matrouh airport ought to be improved.

3.2.4- Communication Systems:

The whole area is served by the radio-link system. There are 8,000 telephone lines in Marsa Matrouh, all of which are already utilized. National authorities provide

communication services.

2.2.5- Services:

Services in study area have special characteristics such as:

1. Absence of governmental care with study area;
2. The bad state of the present services leakage of budget to development it;
3. Poor staffing and equipment of existing facilities;
4. Some services, like education and health, are limited by the local traditions;
5. Poor awareness of the population to their constitutional rights.

3.2.6- Organizational problems:

Existing institutions suffer from a number of deficits and contribute to some problems in the study area. These include:

1 - Non-existence and/or uncertainty of individual land ownership;

2 - Concentration of foreign projects on the coastal roads;

3 - The leakage for the active administrative map compatible with the tribe's borders;

4- There is no coordination on the regional and local levels between plans for different sectors especially agriculture, Urban and tourism requirements;

5-The respect Bedouins have for their common law (Al-Orf) is an important asset in structuring implementation projects;

6- The existence of built as defined corporate land units is a good basis for an implementation sub-unit.

2.2.7- Rare and Endangered Species:

There are direct and indirect causes for ecosystem degradation and species impoverishment in Fuka-Matrouh, (Ayyad, 1993). 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. Illegal woodcutting and overgrazing are the best examples for these direct causes. The indirect causes related to the legal and institutional systems. National institutions lack clear strategies and suffer from the existence of serious conflicts between different sectors.

Most of these species, like gazelle, sea turtles and Egyptian fox, are very restricted in their distribution and obviously threatened.

2.2.8-Impact of Climate Change:

From the viewpoint of general atmospheric circulation, our area, as well as the area between 23 N and 30 N are all located more or less under the influence of the so

called subtropical high pressure system. While the air is almost permanently in subsiding motion, thereby preventing rain mechanisms from temperature and semi-arid conditions are hereby created. It is important, however, to separate the rain mechanisms operating on the high latitude margins of the arid regions from those which operate in low latitude marginal lands. The marginal lands on the high latitude side are bordering on Mediterranean climate with winter rainfall associated with the temperature latitude and varying with fluctuations in the temperature latitude winter circulation. We must therefore expect global warming to be of particular significance in those areas (particularly with respect to rainfall). It is also true that agriculture is often more adaptable to climate change than in many other areas.

In addition to the above mentioned opportunities and issues, there are certain aspects that can, if handled carefully, lead to some benefits to the project area, population and the development process. These aspects can be concluded as follows:

- Abandoned structures in the area, which can be inexpensively refurbished for reuse for permanent or periodical delivery of services;
- Possibility to recruit personnel fulfilling public service requirements;
- Educated Bedouins and those trained in specific programs could be a source of staff for services;
- Willingness of Bedouins to assist in providing facilities for themselves;
- Bedouins trained in various aspects of agriculture, agro-processing or traditional handicrafts are a potential source of teachers for applied subjects;
- Willingness of local population to provide periodical or temporary facilities;
- Midwives active in the area and programs for midwife training;
- Teaching and military hospitals as sources of health care and campaign staff;
- NGO programs available to provide finding and equipment for social programs;
- The absence of wastewater networks leads to the use of pits and septic tanks by tourism resorts. This approach, if not very carefully studied, could lead to the pollution of the water layer under the sand dunes;
- The absence of a solid waste disposal plan in the study area particularly in tourism areas and agglomerated settlements;
- The existing network of tracks is a potential base for a road network;

- Local materials suitable as a base layer for roads are readily available on the coast;
- Roads and railways are important elements in promoting development corridors;
- Unused Roman galleries and wells;
- Sludge from treated wastewater could be used in small projects using bio-energy and for fertilizing agricultural land;
- Abandoned buildings scattered over the study area could be repaired and used as post and telephone centers;
- Renewable sources of energy such as wind, solar energy and Biogas.

2.3 The ICAM Plan Focus:

Study of the project area has revealed that some of the most influential elements on the planning process are settlements, services, resources, and tribal socioeconomic system. Accordingly, the following concepts of the plan are seen to be of great importance:

1. The plan must be flexible;
2. It must act gradually to allow for uncertainties and lack of correct information;
3. The staff should be recruited from local population and services should be mobile;
4. Infrastructure should be self-sustained;
5. Efficient use of local resources is necessary;
6. It is necessary to integrate the tribal system into the decision making process.

The focus of management plan in the coastal strip is, therefore, the preservation of the environmentally sensitive areas and implementation of coastal tourist developments in harmony with natural coastal ecosystems. Strong regulatory measures are necessary in this zone. The balance among main activities (tourism, agriculture and grazing) will be carried out based on carrying capacity assessment. Appropriate Environmental impact analysis of each activity investigated in the plan has to be carried out before its realization.

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. As women are responsible for the daily running activities of the household, they are, at least, indirectly responsible for significant positions of the in-kind income of the family.

Work plan:

We suggest that the following approach should be followed:

1. Group discussions of planners with tribe leaders illustrating socioeconomic benefits of the plan should be carried out;
2. An awareness program that involves subprograms for local problems of desert environment be discussed with tribe leaders first and introduced in meetings;
3. A questionnaire survey could be carried out and administered by direct contact to assess the needs and to provide awareness of the problems and plans for the area.

2.4 Recommendations of the ICAM Plan:

(1) Socioeconomic Awareness Programme:

Of the most important plans, which should be implemented immediately is the socioeconomic awareness program. This is actually because it is prerequisite to any development program. It takes relatively longer time to have an outcome, and it is useful and pays back whether we have other programs in operation or not.

Programs of water supply, institutional capacity building and land use planning together with preservation of cultural and ecological sites must be developed concurrently in an integrated fashion. Failure of having concurrent development of these programs may present serious threat to the sustainable development due to over exploitation of shortsighted private investors.

The development of self-supporting activities as well as the tourism national and international marketing plans would start once the infrastructure has been completed.

(2) Upgrading Water Supply system:

It is essential that projected water demands and supplies are worked out carefully. Two types of water are needed for agricultural and domestic needs. Since the quality of the water must be under control, filtering or recycling units are required. Some form of water management must be exercised for drinking water supplies.

(3) Water Consumption:

Water consumption in Matrouh Governorate depends on the available supply. In summer months, the influx of tourists and holiday-making to the Governorate results in an increased demand for water, and the supply becomes inadequate to meet this increase in demand and resulting in a reduced per capita water consumption rate. Several projects are either under construction or are committed for future development. There is concern, however, that this water supply will be inadequate to meet long-range demands.

(4) Projected Water Demand:

The projected fresh water pipeline estimate to supply approximately 40,000 people. Projected growth for the major urban centers is estimated to be 3 percent, for the smaller rural villages, the estimated growth rate is 2 percent (Ayyad, 1995). Based on the assumed population growth, in 2010, the total supply of water required is estimated to be 8,000 m3 per day in winter and 10,600 m^3 per day in the summer. Three areas were recommended for development, Sidi Abd El- Rahman, Ras El-Hekma, and Hawala. The total recommended development capacity of these areas was 7000; 3,000; and 18, 000 people, respectively. Based on an estimated demand of 200 LCD, the total summer water supply required for these areas is estimated to be 55,600 m^3/day in summer of 2010.

(5) Committed Water Supply Development:

Three projects are the New Ameriyah water treatment plant, and the new desalination facilities at the City of Marsa Matrouh. A well, the Gevar Hot Well, located west of Quattara depression has yield about 17,500 m^3/day was expected to supply Matrouh and hopefully Fuka. Artificial diversion of rainfall is done on an individual small-scale basis. The total yielded of the method of artificial diversion of rainfall varies between 200 to 500 m^3/day. The Ministry of Irrigation has scheduled to extend El Nasr Canal to El-Dabaa to supply the area with Nile Water to enhance agriculture development. It is estimated that extension of this Canal up to Fuka, will make possible the cultivation of about 75,000 Feddans.

(6) Institutional Capacity Building:

One of the most serious problems of the study area is the lack of infrastructure

and institutional capabilities. It is therefore mandatory to start development of various systems such as:

(a) A Geographic Information System must be built and consulted for proper decisions in the area;

(b) A Center for integrated management and education must be developed;

(c) Health and medical services must be provided. Technical schools for exploitation of renewable energy resources must be initiated;

(d) Upgrading Matrouh Water Authority;

(e) A center for environmental monitoring, assessment and law enforcement must be developed.

It is recommended that specifically selected areas will be monitored according to the plan that follows:

It is recommended that the areas given above be monitored for at least one year. During this year:

1. Samples will be collected seasonally from six to nine reference stations distributed randomly;
2. The species composition should be recorded, a museum collection is to be established;
3. Biological samples should include plankton as well as benthic organisms;
4. Endangered species should be observed and recorded;
5. A national arrangement towards protection of coastal areas against pollution and corrosion must be enforced by a monitoring capacity for coastal pollution and land use.

Marine pollution is one of the major environmental problems facing Egypt. According to the International convention for the prevention of pollution from ships (MARPOL 73/78), the coasts are classified as "Special Areas" in which discharge of oil from ships is prohibited. In addition, the draft national law for protection of marine environment whose provide a set of procedures for effective protection of the marine environment, such as:

- Landfill development sites where sustainable development policies and environmental protection measures are conspicuous by their absence;
- Control over new human settlements, must be exercised.

(7) Specific Projects Proposed in the ICAM plan:

A coastal zone management plan will help in solving present and future problems by providing an acceptable balance between economic welfare and environmental well being. In the following some examples specific activities to be carried out:

a- Roads: Developing the present track network into road network and development major tracks to serve as connectors between settlements and services.

b- Water: The development of fresh water supply requires rehabilitating ancient Roman system, expanding existing water harvesting, upgrading distribution facilities and increasing desalination units. Also training local technicians to management the new fresh water supply system.

c- Wastewater: Investigating wastewater disposal methods appropriate to current and future needs. Providing pumping stations and small treatment plants in the large villages.

d- Post and telecommunications: Increasing the number of service facilities and their respective service thresholds.

e- Health: Providing rural health facilities with radio-cable connections to the Marsa Matrouh General Hospital.

f- Solid waste Collection and Disposal Site: Development of a reliable solid waste collection and disposal system be developed. The possibilities of safe disposal of sludge must be worked out.

g- Energy: Undertaking model trials for solar energy; promoting the use of wind-generated energy for pumping water and wastewater.

(8) Preservation of Cultural and Archeological Sites:

It has become abundantly clear that the Historic Pilgrimage Center of Saint Menas is fully qualified for revival.

Pilot Project Proposal

This section is devoted to the detailed presentation of material pertinent to rehabilitation, if deemed acceptable, of the Pilgrimage Center of the Christian Martyr Saint Menas .

Site Potentials:

The Historic Site of Abu Mena is considered ideal for rehabilitation. The following features may support justification for this conviction:

a- Its asserted importance; locally, regionally and internationally;

1. As it is representative of a living and continuing culture, the conservation works necessary for the rehabilitation project can proceed with a greater degree of freedom in handling and treatment of architectural elements;
2. Activity in the immediate vicinity, Abu Mena Monastery, is not only very friendly but also compatible and conforming;
3. The surrounding area beyond has already been neutralized through a series of effective measures;
4. The enclosing canal will, besides acting as environmental security boundary for the site, serve as an exclusion barrier and as a reservoir for drainage water from adjacent fields;

f- When reconstruction and development are fully completed, final rehabilitation will be enshrined with full restoration of site function;

g- The ultimately recovered Pilgrimage Center can easily retrieve, and retain, its older magnificence and compete and compare favorable with other pilgrimage attractions; for example, Lourdes (France) and Saint Fatima (Portugal), with the prospects of covering the total costs of the project in a fairly reasonable span of time.

Work plan:

In the field of Historic Heritage, however, professional competence is necessary but not entirely sufficient and must be complemented and sustained by proven, profound and refined sense of culture. The right approach in the view of (Ismael, 1995) is, to draw on the resources of the related Priority Program at the Split Regional Activity Center (PAP/RAC) of the Mediterranean Action Plan (MAP) where considerable experience has been building up.

Rehabilitation Framework:

In an attempt to reveal-at least- the principal components of the center essential for restoring the original religious functions to the place. Return to operation of health and healing facilities and provisions known from ancient times must also be envisaged. Since water is the primary, and most significant, asset of the center; extraction and management system will have to be established. Natural flora may also be worthy of a similar handing and appreciation. It is, moreover, suggested that alien structures already existing within the enclosure be made to blend smoothly with the present and projected. Finally, the proper organization of an international fund- raising campaign, will be one of the major inputs throughout all phases of planning, design and

implementation of the proposed project.

a- Updating geographic information on each archeological site;

b- Initiating a program to preserve existing sites;

c- Building well marked accessible hotels for one day tourist visitors of the area;

d- A program for rehabilitation, revival and protection of historic pilgrimage center of Saint. Minas site. UNOSCO and other international organizations could help development.

Land use planning

The hierarchy of land use planning systems, it should be mentioned, is not well coordinated and lacks public participation. If land use planning systems could be improved, coastal area management systems can be an extension of such systems. The following are the main lines of activities for development of a land use plan:

1. establishment of demonstration pilot areas for protection and controlled grazing;
2. initiation of a cooperative system for grazing management between the main tribes;
3. formation of an extensive program for range improvement by the propagation of multipurpose;
4. establishment of nature reserves, and
5. Development of aquaculture sites near tourist centers.

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.

b. Cooperative System for Grazing Management

The idea of initiating a system for cooperative grazing management in the rangeland 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. It is unfortunate however, that at present, there are no technically qualified range management practitioners to apply the results of extensive research accumulated over the past 30 years. It is unfortunate also that, virtually no coordination, is taking place among researchers from different organizations (El-Raey, et. al, 1998). It is proposed that range plants seed production cooperatives be established to supply the necessary

seeds and transplants for range improvement. The Range land Agency is to assist in the establishment of nurseries through providing technical assistance and possibly through securing initial seed supply and necessary land. The increase in the number of water points in the northern part of this region has contributed to the degradation of rangeland

Propagation of Multi-purpose Species:

It is of great importance that an extensive program be formulated and executed for the propagation of multipurpose species, and essentially native 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. The main premises that should govern such program are:

a) Promotion of the idea should be both at the level of the decision-makers;
b) Propagation of species should be carried out with the minimal disturbance of the natural system;
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 on the following main items: (a) Seed collection; (b) establishment of seed banks; (c) establishment of nurseries; and (d) demonstration field experiments.

The Ministry of Reconstruction and New Settlements could be the main supporter of such activities.

Tourism marketing plan:

The main income for the community in the project area is expected to be associated with tourist activities. Good services and international marketing plan based on selling the following unique features of the project area are necessary:

(1) Natural environment and natural agriculture
(2) Archeological sites and close association with Alamein and Abu Mina sites.
(3) Unique beaches, clean air and low population density.
(4) Special handicrafts (Ministry of Tourism).

(5) Health tourism

Timing:

While recommendations for these actions are an integral part of the development plan, their urgency in some cases, and their proven suitability for the area and acceptance by the population in other cases, indicates that they should not be postponed until the Development Plan is ratified and put into effect. These recommendation are divided into two main categories:

a- activities which should be undertaken by the Fuka Matrouh project team including model trials to test the recommendations of the development plan activities which are implemented in the plan; and

b- activities, which should be undertaken by other local institutions to, ensure that negative trends and obstacles do not hinder future development in the area.

Chapter III

Objective of National Environmental Policies

3.1 Background:

The purpose of EIA is to ensure the protection and conservation of the environment and natural resource including human health aspects against uncontrolled development. Within the framework of sustainable development, the Governorate of the Arab Republic of Egypt has issued Law No. 4 of 1994 concerning protection of the environment.

The objective of this law, however, has not been confined to addressing pollution problems emanating from existing establishments, but also to involve new establishments/factories including expansions of the existing ones. The new establishments are required to carry out an environmental impact assessment of the establishment before embarking on the construction or the implementation of the project or the relevant expansions.

Meanwhile, in the context of experiences acquired in other areas in the world. The main objective of requiring new establishments to carry out the environmental impact assessment is to support rather than prevent or obstruct the development activities in the country, through identifying negative and positive impacts of the project, and maximizing positive impacts and minimizing negative ones. Such an approach realizes the concept of sustainable development without which our limited natural resources can be exposed to depletion and deterioration.

The aim of these arrangements is to help the competent administrative authorities and the licensing agencies in implementing and enforcing articles of Law No.4 of 1994 concerned with the Environments Impact Assessment requirements.

Law No.4 states that the environmental impact of certain establishments or projects must be evaluated before any construction works are initiated or a license is issued by the competent administrative authority or licensing authority.

The Executive Regulations relating to Law No. 4 identifies establishments or projects which must & subjected to an Environmental Impact Assessment based upon the following main principles:

1. Type of activity performed by the establishment;
2. Extent of natural resources exploitation;

3. Location of the establishment; and
4. Type of energy used to operate the establishment.

3.2 The List Approach

The list approach depends on screening projects into three categories based on different levels of EIA required according to severity of possible environmental impacts as follows:

1. White list projects for establishments/projects with minor environmental impact;
2. Grey list projects for establishments projects which may result in substantial environmental impact; and
3. Black list projects for establishment projects, which require complete EIA due to their potential impacts.

3.3 Environmental Protection System

In the following sections, the introduction of EIA in Egypt is discussed. First, the existing environment related institutional framework is described, including the applicable legislation and the major institutions involved in environmental protection in Egypt, as provided by the Law Number 4 of 1994, is detailed.

3.3.1 Institutional Framework:

- As aforementioned, Law Number 4 of 1994, promulgated on January 27, 1994, was a significant milestone for Egypt. The law seeks not only establishment of a fund to be used for the purpose of environmental protection, but also clearly defining the need for EIAs. The prime feature of the law is the creation of a new agency, the agency for environmental affairs, which is to oversee environmental protection within the country.

7 The key player in environmental protection is now the *Egyptian Environmental Affairs Agency (EEAA)*, which was established by the Presidential Decree of Number 31 of 1982.

This agency, established with cabinet premiership, specifically replaces the EEAA and is attached to the minister with environmental affairs with its own separate budget. One estimate put the budget of the EEAA at LE 118 million for the period 1987 to 1992 (ECEP, 1995). There is also a prevision in its charter to establish branches in each of the governorates.

3.3.2 Legislative Framework:

As mentioned previously, the recent passage of Law Number 4 has apparently significantly altered the institutional framework for implementing environmental protection. However, the enactment of the law is being followed by the formulation of executive regulations, which will form the crux of the implementation mechanism and determine the actions required to develop the country in an environmentally sound manner.

Three aspects related to coastal areas are involved in the mentioned law:

1. Identify the relationship between development and environment (Chapter One – Part One): The concerned administrative authority or authority granting the licenses, shall evaluate the "Environmental Impact Assessment" (EIA) of the establishment for which the license is requested, and hand it over to EEAA for review within a period of 60 days. The concerned authority shall notify the owner of the establishment with the result of evaluation. He may object, in writing within 30 days. The owner of the establishment according to this law shall keep a register showing the impact of the establishments activity on the environment;
2. Part three of the law identifies the legislation of protection of water environment from pollution;
3. The protection of shoreline is established.

Even prior to passage of this law, Egypt was not without environment specific legislation. The country has a whole plethora of laws and regulations that had an impact of the environmental protection of coastal environment, such as following manner:

i. International Convention for Protection of the Sea to which Egypt is a party [London, 1954 ; as amended on 1962, London Protocol 1973,Barcelona Protocol 1976, Athens Protocol 1980, Geneva Protocol 1982];
ii. Law 72-1968 complements the International Convention for the Protection the Sea and Coastal Area by Egypt through Presidential Decree 421-1963;
iii. Presidential Decree 1948-1965 as amended by Decree 691-1972 establishes a Permanent Committee for Presentation of Pollution of Sea by Oil.

Concerning SEA, no mention of it in the national environmental law (No. 4 / 1994) non-in any other documentation of the EEAA. This reflects some weakness, yet

it is expected to be treated at later stages of the national environmental law implementation and enforcement.

Chapter IV
Description of Study Area

Matrouh Governorate occupies a wide sector from the north West Coast of Egypt. This Governorate is the second largest Governorate in Egypt with an area 212,112 km^2 (about 22% of Egypt's area). Administratively, Matrouh Governorate is divided into five districts each of them is known as "Markaz". These are from east to west: El-Hammam, El-Dabaa, Sidi Brarani, and El – Salloum. The Governorate is characterized by a very low population density, according to the preliminary result of census, the population of the Governorate is about 211,966 which gives a population density of about one person per km^2.

The study area of Fuka – Matrouh, is located in the middle upper portion of Matrouh Governorate. This area is rectangular in shape and extends along the Mediterranean Sea for about 60 km from Ras El-Dabaa to the east (longitude 28° 25` E) to Ras El-Hekma (sometimes called Ras El-Kanaias) to the west (longitude 27° 50` E). The area is rather narrow in width as it extends for about 30 km from the shoreline (latitude 31° 05` N) to the elevated structural plateau (latitude 30° 15` N). Alexandria is about 210 km east of study area and Marsa Matrouh City is about 70 km to the west (Figure 2).

4.1 Natural Features:

4.1.1 Morphology and Topography

Using remote sensing and field observation, the geology of the study area is a simple one, where the area is covered by sedimentary rocks that vary from limestone to lime-sandstone and marl. The country rocks belong to the Miocene, Pliocene and Pleistocene age. The topography of the area is of unique features. The area contains different elevated hills varying from 5m to 90m above the sea level.

4.1.2 Climate

The project area has a semi-arid Mediterranean climate, characterized by a brief, mild, rainy winter and long warm summer months (May to September) of clear sky, high radiation, and no rain. The picture changes in October when a windy and

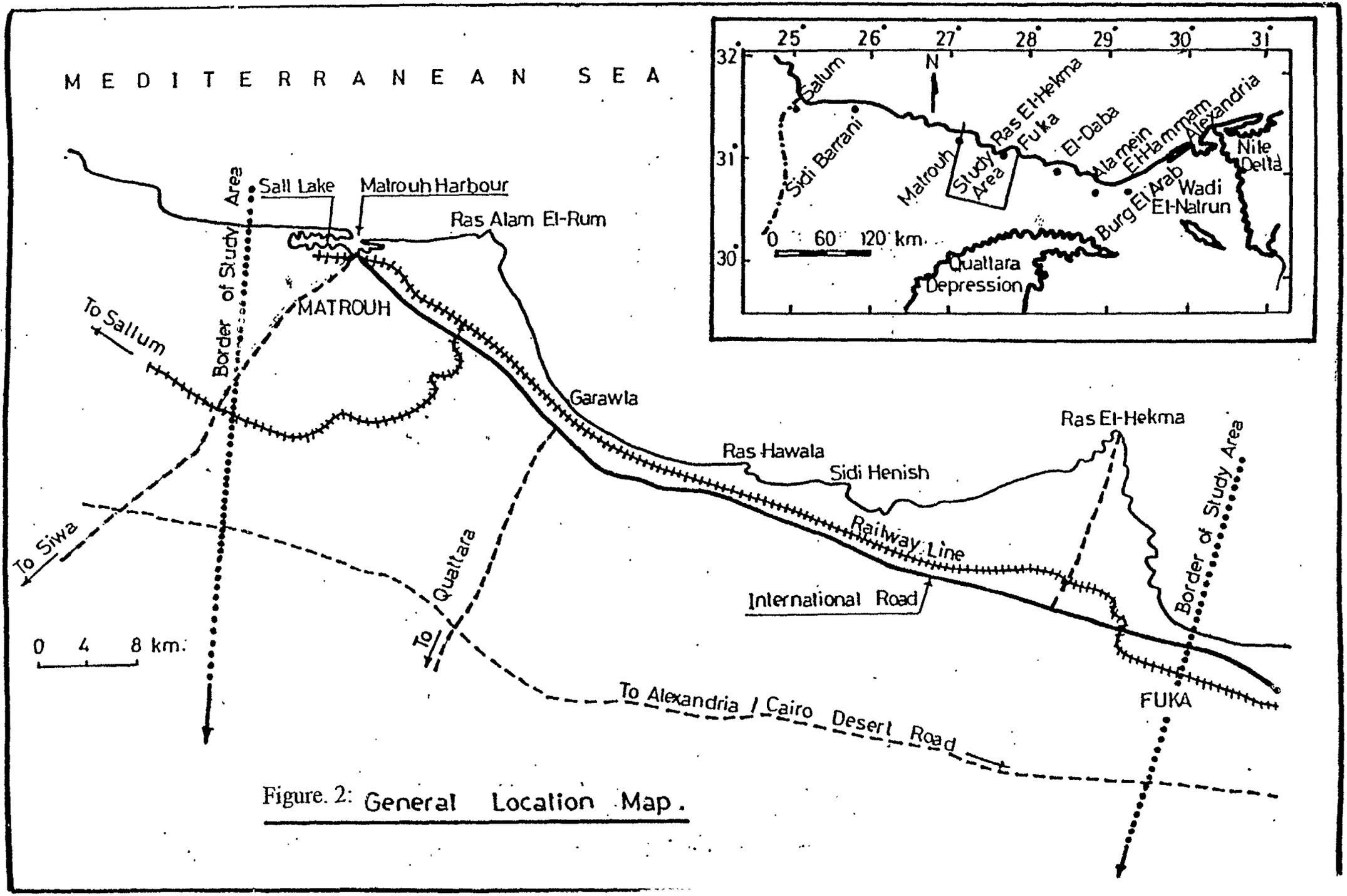


Figure. 2: General Location Map.

relatively rainy winter begins. The climate is described completely in the following climate parameters.

- *Temperature:*

The temperature is almost moderate during the four seasons in this area. The temperature does not exceed 28.5 °C in the summer and does not go below 10 °C in winter.

- *Wind:*

The wind speed doesn't exceed 10 m/sec, over almost 95% of the year. Along most of the year, it blows from North to North West direction with a percentage of 21% and the wind in summer comes from North West direction. However, during spring months, the area is subject to Khamaseen hot winds, which blow from the southwest, carrying sands and dusts from the desert.

- Humidity:

The average humidity percentage is around 61.3% and 75.6% during the year. The most suitable time for seaside tourism is summer starting from June till the end of October where the maximum and minimum, average temperature are around 27 °C and 21 °C, respectively.

- Rain:

The amount of rainfall in the project area is approximately 140 mm./yr. Most of the rainfall occurs in winter with maximum in December (in Marsa Matrouh 38.7 mm) and January. Summer seasons are virtually dry.

4.1.3 Natural Water Resources

The site depends on natural water as the major source of its needs (agriculture, drinking...) The importance of natural water resources, can be illustrated as follows :

- Rainfall and Water Flood:

As shown in Figure.3; the homogeneous region from Ras El-Hekma to Matrouh will continue to depend mainly on rainwater for irrigation and most of the drinking water.

- Underground Water:

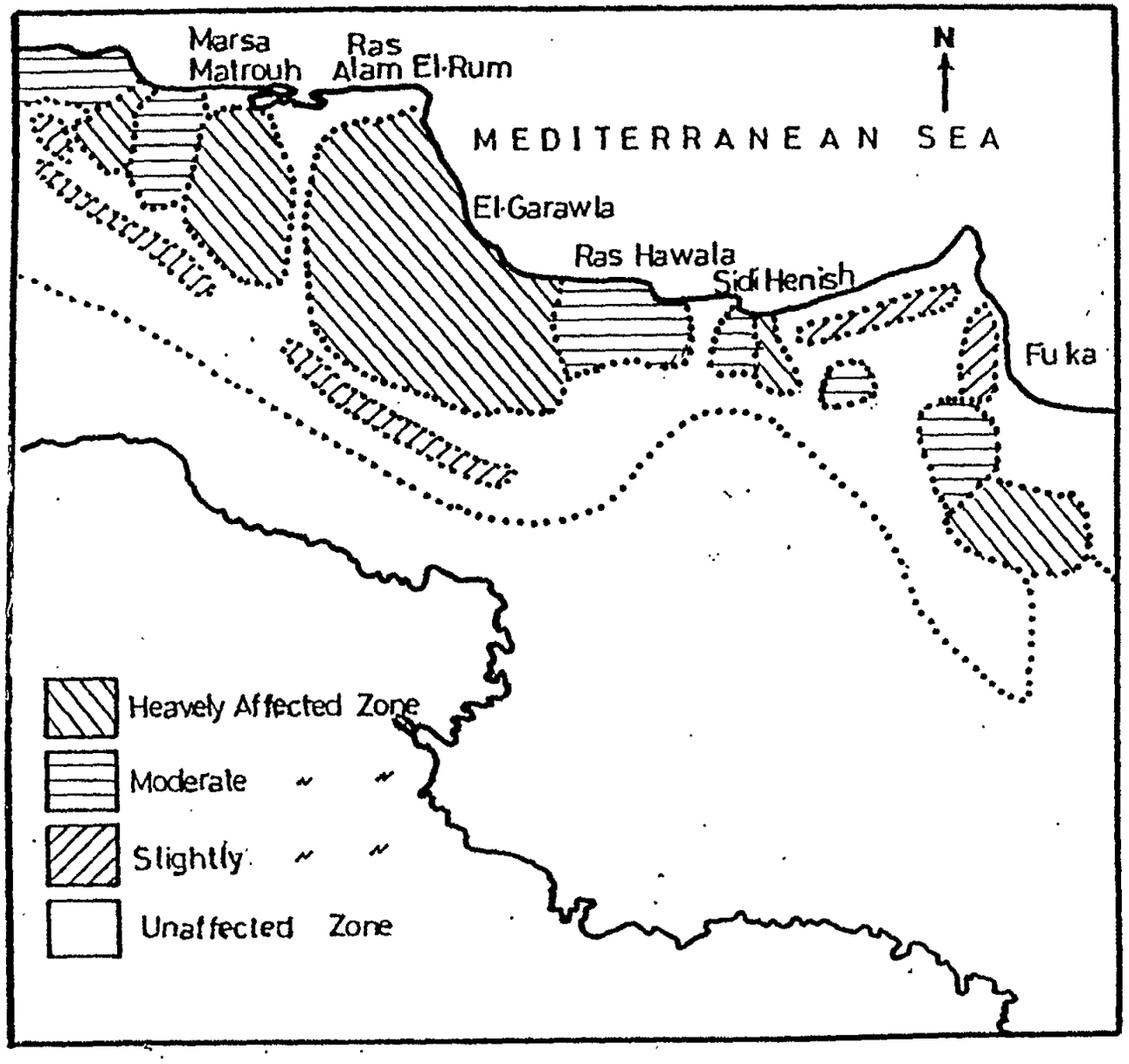


Figure. 3 : Water Flow Zones ; Fuka - Matrouh .

Source: Governorate of Matrouh, Office of Irri...

In general the underground water is found at the sediments layers (at the study area). Water generated by shallow well is limited in quantity. It is of deteriorated quality due to its presence in thin layers with low coefficients of permeability and dependence on seasonal rainfall. Underground water can also be found in the limestone layers available under the Fuka basin. It can be give a rate of 20 m^3 / Hour for some wells with an average quality, which gives approximately 2 million m^3 / year, only 72000 m^3 / year are used which gives a special importance for the basin.

Also some additional potable water is provided, mainly to the population on the coast, through the water pipeline from the Nile through Alexandria, which extend Matrouh desalination units.

4.1.4 Flora

The region of study area has a heavy floura that begins at the coastal area and extends to the rocky plateau. There are two kinds of floura in this area:

1. The first kind: arks planted with olive, palm tree, wheat depending on rainfall and wells that are randomly distributed.
2. The second kind: parks of coastal plants and herbs.

4.1.5 Soil

All the beaches are composed of white, loose carbonate sands, well polished and round moving towards inland. The loose carbonate sand gradually change to fairly consolidate limestone-forming ridges that skirt the coast. The ridges are of marine origin and represent bars and depressions, which separate ridges form lagoons in which alluvial loam deposits are present, mixed with calcareous sand. The depressions that are close to the shore are salt affected, i.e. unsuitable for cultivation.

In winter, salt marsh conditions prevail in the low parts of these depressions. Generally; the soil in the beaches – that is affected by salt - are unsuitable for cultivation; opposite to the soils in the wadies and around highways.

4.1.6 The Shore line

The coastline of this area is of sandy rocks covered by soft sand along the shore, with certain solid rocks headland and sandy beach, with smooth degradation in the area, which gives a good opportunity for tourist development. The shoreline is

characterized by the presence of successive bays, formed by rocky headland. This rocky edged decrease in the south.

4.2 Socioeconomic Conditions:

4.2.1 Population

Preliminary results of the 1996 Census show that Matrouh Governorate has a population of 211,966 inhabitants, which gives a population density of about one person per km^2. About 40% of the total Governorate population are concentrated in Marsa Matrouh City and its hinterland. As for urban / rural distribution, 53% were living in urban areas, while the rest in rural areas. It should be mentioned that this distribution is almost similar to that of Egypt as a whole. About 86% of inhabitants is Bedouin (El-Raey, et. al, 1997).

4.2.2 Labor Power

The labor status of a local people - Bedouin – is described as follows: About 60% of the farmers allocate from 10 to 20% of the family labor to barley cropping, whereas 5% allocate as high as 30%; some farmers (12%) have no barley fields. Family labor for tree production is similar to barley in level of allocation which is seldom more than 30% of the total family labor, about one third of farmers never use family labor for tree production. The family labor allocated for vegetable cultivation is less than 20%; about 85% of the farmers have no vegetable cultivation(El-Raey , et. al, 1997) .

About 40% of the farmers allocate family labor for domestic tasks and non-production labor. This allocation includes tasks, which are primarily performed by females: preparation of food, the care of family clothing, and handicraft production. There is an overlapping of labor roles for males and females in the harvesting of barley, fig and olive as well as working with animals in need of special care.

Eighty percent of the Bedouin are engaged in sheep and goat herding and the cultivation of vegetables and trees. About 15% depend on trade as a source of barley and the remaining 5% work for the government or private employers. Most males work in traditional agriculture and animal husbandry. Commerce meanwhile occupies a small percentage of the male labor-force. Women are occupied by the tasks of children and family affairs, household chores, tent repair, weaving, and herding of sheep near home. Work for females outside the family is still considered as improper.

We may conclude from the previous analysis of the human resources that the population of the NWC region has certain characteristics that could be summarized as follows (Ayyad, 1995):

- High percentage of population under 15 years, and low percentage of working population in the productive age, compared with the national standards.
- Low educational standards, and high illiteracy, which reached *75%* of the population
- Neither the number of the population, nor the educational or training conditions, can offer satisfactory economic base considering the vast acreage of the region, a matter that leads to possible in - migration to the region with application of development programs.
- Despite the fact of the small size of the population, it should be necessary to depend on local skills in traditional agriculture and husbandry grazing, in trade and commerce. Their long acquired experience will enable them to play an important role in developing and financing different projects.

4.2.3 Tribes

Tribal borders are one of the best-known and documented facts in Matrouh. They are given considerable importance in the developing plan because they represent the clearest planning units; and because in this area, boundaries for villages and districts- which divide planning for a region of this size into manageable units – are incomplete and/or uncertainly defined.

While tribal borders are clearly defined, the location and size of settlements within these boundaries is uncertain. Part of this problem is due to the mobility of Bedouins, particularly within tribal boundaries. Especially where a tribe has land in several zones, cultivate barley on the north plateau and graze their flocks on the south plateau. Even families with land limited to a single zone may rent holdings elsewhere for the cultivation of barley and may send their flocks with hired herdsmen to distinct areas for grazing.

4.3 Economic Activities:

4.3.1 Agriculture:

According to governmental estimation of the agriculture state in Fuka -

Matrouh area (IDSC, 1993) the land use for agriculture is about 86543 Feddan, the main crops are wheat and barley. The main problem that faces agriculture is water, Local farmers depend on rainfall, so, crops productivity varies according to rainfall. The agriculture zones are shown in Figure.4.

4.3.2 Grazing:

Grazing is the main activity for Bedouin. In 1992, the flocks/herds are estimated at (IDSC, 1993):

- 555300 sheep;
- 31373 goats;
- 8 thousand camels.

This is in addition to some cattle and donkey breeding. The value of investment on grazing is estimated at 37.5 million Egyptian pounds.

4.3.3 Handicrafts and Agro-Industry

Women of the region mainly undertake handicrafts and agri-products. To a large extent they depend on agricultural and animal raw materials. The most important of these activities are (Zoghby, 1990):

- producing carpets, blankets and tents; spinning wool, leather curing, embroidery and sewing;
- picking olives, drying peppermint, and producing olive oil;
- Breeding poultry and rabbits.

4.3.4 Trade and Transport

In earlier times, the Bedouins monopolized trade and transport. While the form of transport has changed from caravans to pickups, and trade includes new items such as land; the role of Bedouins in this economy is still strong formally and informally especially in animal trading. The transportation network is depicted in Figure.5

4.4 Environmental Problems:

Fuka – Matrouh is a virgin area, wherever no developments induce manmade environmental problems. Except, if some local problems considered as environmental

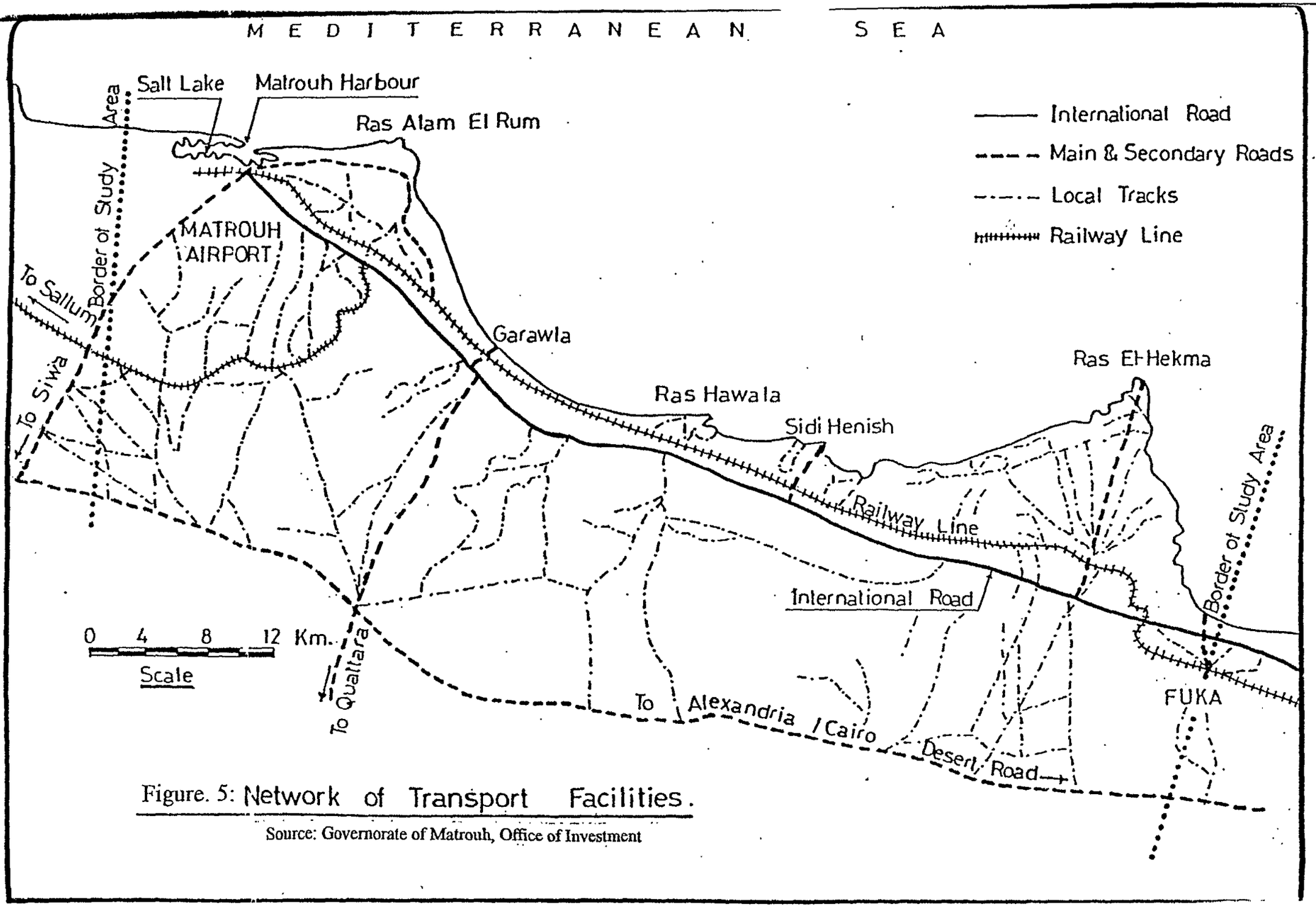
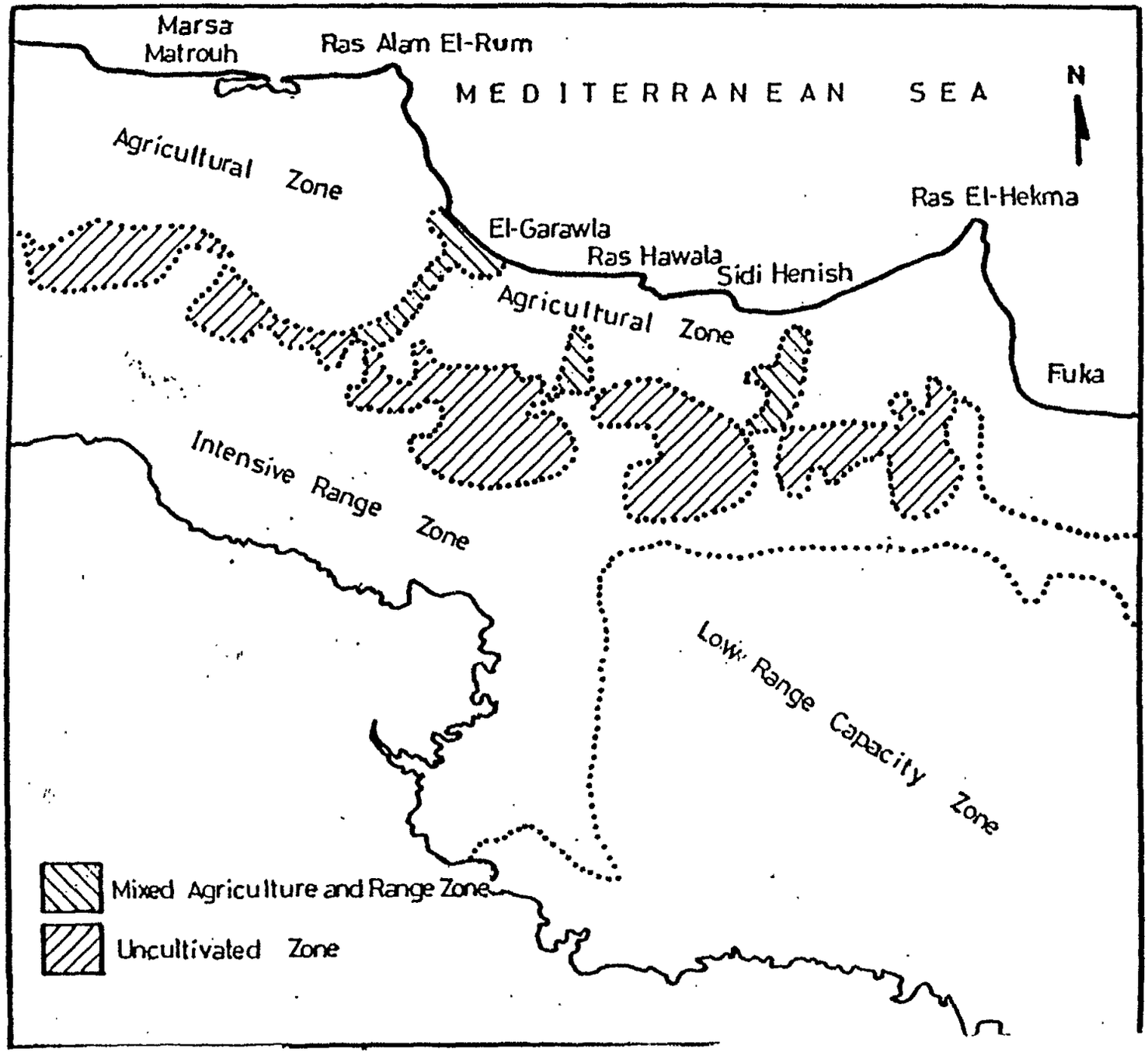


Figure. 5: Network of Transport Facilities.

Source: Governorate of Matrouh, Office of Investment


Marsa
Matrouh
Ras Alam El-Rum
MEDITERRANEAN SEA
N
Agricultural Zone
Ras El-Hekma
El-Garawla
Ras Hawala
Sidi Henish
Agricultural Zone
Fuka
Intensive Range Zone
Low Range Capacity Zone
Mixed Agriculture and Range Zone
Uncultivated Zone

problems. In the following, a brief description for these problems:

- Overgrazing: Overgrazing is a critical problem in the study area since the socio-economic system of the study area is grazing dependent. The damage of grazing land leads to unbalancing of the socio-economic system. So, this problem has ecological, social and economical dimensions.
- Fresh Water Shortage: The shortage of fresh water resources is a chronic problem in the study area. The main fresh water resources in the study area are ground water and rain water. The ground water - sometimes - has a semi-saline taste and it found near to earth surface on the coastal band. In general these ground water used for irrigation some crops. Most of the rain falls during the period between October and February (mostly in December and January), with a mean annual of about 150 mm. Some irrigation projects are carried on. El Nasr Canal, Bahig Canal extension, and coastal fresh water pipeline are supply the study area with fresh water from Nile.
- Low Income: The shortage of agriculture resources and the absence of industrial investments are the main factors to limit income in the study area. As mentioned above, the socio-economic system in the study area is grazing dependent, but the quality and quantity of grazing yield are not enough to avoid this problem.
- Desertification: The land suitable for the agriculture in the study area is limited. It is exposed to desertification by wind and soil property degradations.
- Marine Pollution: This problem is concentrated in hot spots along Egyptian-Mediterranean coast, related to oil production stations and oil harbour. The most hot spot closest to the study area is El-Mina El-Hamra.

Chapter V

Identification of Effects and Impacts of Implementing the Integrated Coastal Area Management (ICAM) Plan

There are many methods for identifying environmental effects and impacts e.g. Overlay method, Checklist method, Matrices method, and Network (sometimes known as flow diagrams) method. This chapter includes two main sections. The first section to describe the matrix method, and the second to environmental analysis of this matrix.

5.1 Matrix Method:

The matrix method is one of the widest methods used in Strategic Environmental Assessment (SEA). This method is useful for the identification of possible impacts and evaluating impacts on environmental elements. It correlates cause-effect relationships between specific project activities and impacts (ECEP, 1995), Matrices typically employ a list of human actions in addition to a list of impact indicators. The two are related in a matrix which can be used to identify (to a limited extent) cause and effect relationships (Munn, 1979). The matrix analysis produces changes in various aspects of the environment (natural, built, social, economic and so on) existing on the application site and its surroundings (Nathaniel and Lichfield, 1992).

The whole multidisciplinary team has carried out matrix evaluation together. Suggestions and recommendations of the consultant have also been taken into consideration. The scale used to measure the impact's weight ranges from (-5) (highly negative significant impact) to (+ 5) (highly positive significant impact). Zero means there is no impact for action on environmental elements.

5.2 Environmental Analysis:

Human actions in study area are classified into six classes: Transportation, urbanization and services, industrial development, agricultural and related activities, tourism development, and complementary activities.

Magnitude Matrix

	Geology	Soil	Coastal erosion	Landscape	Ground water	Sea water quality	Marine life	Grassland	Existing roads	Existing water network	Waste water facilities	Communication system	Historical buildings	Tourism	Agriculture	Grazing	Employment	Income of local population	Health conditions Education	Education	Culture
Airport	0	0	0	-1	-1	0	0	0	-2	-1	0	-2	-1	+3	+2	+1	+2	+2	+1	+1	-2
Railway upgrading	0	-1	0	-2	-1	-1	-1	-1	+1	0	-1	-1	-1	+4	+2	+2	+3	+2	+2	+2	-1
Road upgrading	0	-2	0	-3	-2	-1	-1	-2	+4	-1	-1	-1	-1	+5	+3	+2	+4	+3	+2	+3	-2
Residential (1)	0	-1	0	-3	-3	-1	-1	-2	-2	-3	-4	-3	-2	+1	+1	+1	+1	+1	-1	+2	-2
Residential (2)	0	-1	0	-2	-2	-1	-1	-1	-1	-2	-2	-1	-1	+1	+1	0	+1	+1	0	+1	-1
Water supply system	0	+1	0	-1	+1	0	0	+1	-1	+4	-2	0	-1	+5	+4	+4	+4	+3	+4	+2	+1
Sewage treatment & sewage	-1	+1	0	-1	-3	+2	+2	0	-1	+1	+4	0	-2	+4	+3	+2	+3	+2	+4	+1	+1
Electricity distribution	0	0	0	-2	-1	0	0	-1	0	0	0	+2	0	0	+1	0	+2	+1	+1	+2	-2
Communication	0	0	0	-1	0	0	0	-1	0	0	0	+4	0	0	+1	0	+2	+1	+1	+2	-2
Medical services	0	0	0	-1	-1	0	0	0	+1	0	0	0	0	+2	+2	+2	+1	+1	+4	+2	+2
Education services	0	0	0	-1	+1	+1	+1	+1	+1	+1	+1	+1	+2	+3	+2	+1	+3	+2	+2	+4	+2
Cultural services	0	0	0	0	0	0	0	0	0	0	0	+2	+2	+1	0	0	+1	+1	+1	+3	+3
Food processing	0	-2	0	-1	-1	-1	-1	-1	-1	-1	-2	-1	-1	+1	+2	-1	+2	+2	+2	-2	+1
Light industry	0	-1	0	-1	0	0	0	-1	-1	-1	-1	-1	-1	+1	+1	-1	+2	+2	-1	0	+1
Quarries	-2	-4	0	-4	-1	0	0	-1	-2	-1	0	-1	-3	+1	-1	-1	+2	+3	-1	0	-1
Wood industry	0	-1	0	-1	-1	0	0	0	-1	-1	-1	-1	-1	+2	+1	+1	+2	+2	0	+1	+1
Farms	0	+1	0	-1	+2	+1	+1	+2	-1	+1	+1	-1	0	+2	+4	+3	+4	+3	+1	+1	+3
Cooperative systems	0	+1	0	-1	+2	+1	+1	+2	-1	+1	+1	-1	0	+2	+4	+3	+4	+3	+1	+1	+2
Grazing practices	0	+2	0	+2	0	0	0	+1	0	0	0	0	0	0	-1	+3	+2	+2	0	0	+4
Land reclamation	0	+3	0	+2	-1	0	0	+1	+1	+1	0	0	0	0	+3	+2	+2	+2	0	0	+3
Water barriers	-1	+1	0	+1	+2	0	0	+2	+1	+2	0	0	-1	+1	+4	+2	+3	+2	+1	0	+2
Tourism resorts	0	-1	-1	+1	-1	-2	-2	-2	-3	-3	-2	-2	-2	+3	+1	+1	+3	+2	0	0	-4
Hotels & restaurants	0	-1	0	-1	-1	-2	-2	-1	-2	-2	-2	-2	-2	+2	+1	+1	+3	+2	0	0	-4
Marina	0	-1	-2	+1	-3	-3	0	-2	-1	-1	+2	0	-1	0	0	+2	+2	0	0	-2	-2
Natural parks	0	+2	0	+3	+1	+1	+1	+3	+1	+1	+1	+1	+1	+3	+2	+2	+1	+2	+1	0	+2
Excavation	0	-1	0	-2	0	0	0	0	0	0	0	0	+3	+2	0	0	+1	0	0	+1	+1
Information center	0	+1	0	-1	+1	+1	+1	+1	+1	+2	+1	+2	+1	+1	+2	+2	+1	+1	+1	+1	0
Water authority upgrading	0	0	0	-1	+1	0	0	0	0	+4	+1	-1	0	+3	0	0	+1	+1	+2	0	0
Environmental monitoring	0	+1	0	-1	+2	+2	+2	+2	0	0	+1	+2	+2	+2	+3	+2	+1	+1	+2	+1	0
Social & culture development center	0	0	0	-1	+1	+1	+1	+1	+1	+1	+1	+1	+3	+2	+3	+3	+1	+1	+2	+2	+3

Significance Matrix

	Geology	Soil	Coastal erosion	Landscape	Ground water	Sea water quality	Marine life	Grassland	Existing roads	Existing water network	Waste water facilities	Communication system	Historical buildings	Tourism	Agriculture	Grazing	Employment	Income of local population	Health conditions	Education	Culture
Airport	0	0	0	1	0	0	0	0	1	0	0	1	2	4	3	2	2	2	1	1	1
Railway upgrading	0	1	0	2	1	1	1	0	2	1	1	1	2	5	4	2	3	3	1	2	2
Road upgrading	0	2	0	3	1	2	1	1	4	1	2	1	3	5	4	2	3	4	2	2	3
Residential (1)	0	3	0	4	3	2	2	1	2	4	3	3	1	2	3	2	1	2	1	2	2
Residential (2)	0	2	0	3	2	1	1	1	1	2	2	2	1	3	2	1	1	2	1	1	1
Water supply system	1	1	0	1	2	0	0	1	1	4	3	1	1	5	2	2	3	2	1	1	2
Sewage treatment & sewage	2	3	1	2	2	2	2	1	0	3	5	0	2	5	3	2	1	1	3	1	1
Electricity distribution	0	0	0	2	0	1	1	0	0	1	3	3	1	5	3	2	1	2	0	1	2
Communication	0	0	0	1	1	0	0	0	2	1	1	5	1	5	2	1	1	2	0	2	3
Medical services	0	0	0	0	0	0	1	1	0	0	1	1	0	1	0	0	1	1	4	3	2
Education services	0	0	0	0	1	1	1	0	1	1	1	0	1	1	1	1	3	1	3	4	3
Cultural services	0	0	0	1	0	0	0	0	0	0	0	0	3	1	0	0	1	1	0	3	4
Food processing	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0	0	0
Light industry	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	2	2	0	0	0
Quarries	4	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	3	0	0	0
Wood industry	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	2	2	0	0	0
Farms	0	3	0	3	1	0	0	0	1	1	1	0	0	1	4	0	3	3	1	0	0
Cooperative systems	0	3	0	1	1	0	0	1	1	1	1	0	0	1	2	0	3	3	1	0	0
Grazing practices	0	0	0	1	0	0	0	4	0	0	0	0	0	1	0	4	3	3	1	0	0
Land reclamation	0	5	0	5	3	0	0	2	0	0	1	0	0	1	5	4	3	2	0	0	0
Water barriers	0	0	4	0	4	4	0	0	4	0	3	0	0	0	5	1	0	1	4	0	0
Tourism resorts	0	1	1	4	2	4	1	0	4	3	4	3	1	5	1	0	4	4	4	0	0
Hotels & restaurants	0	0	0	0	2	0	0	0	5	3	3	4	0	5	1	1	0	4	0	0	0
Marina	0	0	4	4	0	4	4	0	1	0	0	1	0	4	0	0	3	3	0	0	0
Natural parks	0	1	0	4	0	0	0	0	1	0	0	0	4	3	0	0	0	1	0	0	0
Excavation	3	3	0	1	1	0	0	0	0	0	0	0	5	4	0	0	1	1	0	0	0
Information center	0	4	4	4	1	1	1	1	4	2	4	3	1	2	3	3	1	1	0	1	0
Water authority upgrading	0	3	0	2	4	0	0	1	0	4	1	0	0	4	4	0	1	1	4	0	0
Environmental monitoring	0	2	4	3	4	4	3	2	1	1	1	1	1	4	4	4	4	1	4	4	4
Social & culture development center	0	0	0	1	0	0	0	0	1	0	3	3	3	3	4	4	3	1	3	3	4

5.2.1 Transportation:

Upgrading transportation is the most important factor in economic development operations in the study area, this shows in the matrix as a high weight on tourism, agriculture, and grazing. Indeed, Upgrading transportation will lead to increasing demand on food produced locally (vegetables, fruits, and meat) or exported from outside the study area. So upgrading of the transportation network will support tourism. On the other hand, the effect of upgrading transportation network will affect employment and local income, directly by creating new employment chances in the network itself and indirectly by employment in agriculture, grazing and tourism, and increasing income resulting from marketing local products.

The impacts of upgrading transportation network on the local landscape are noticeably negative. These impacts are expected to result from the nature of upgrading and building the network. Since the airport is locate outside the study area, its impacts on landscape – in the study area - may be ignored.

Upgrading transportation network also has significant positive impacts on health conditions and education by sponsoring tools of the services related to these elements. The insignificant impacts for updating transportation network result from two aspects.

First, as a result to the accessibility of tourism to the study area sponsored by updating transportation network, some of local behaviors are replaced by foreign behaviors. This may be better or worse than the local behaviors, but as total this replacement will lead to loose one of the components of Bedouin culture.

Second, the civilization moving toward desert will compete with the local simple civilization, on the long range the local folklore may be vanished.

5.2.2 Urbanization and Services:

Urbanization and services include actions like residential areas, communications, educational services, medical services, and culture services, also may be extent to cover marina like a service. Services have highly significance impacts on the health conditions, education and culture, this is a normal because this services related to the mentioned elements.

Marina has opposite impacts on culture and education for the same causes that talking about it in the transportation. Medical and educational services have positive impacts on tourism, agriculture, and grazing because these services sponsor best health

conditions (physical and mental) for the workers, sure this progress reflected on the productivity of them. Educational and cultural services will support awareness of preserving historical sites.

5.2.3 Industrialization Activities:

Industrialization activities represented on activities like food processing, light industry, quarries, and furniture. These activities depend on local raw materials; so, we can say these activities not harm the environment. The main positive significant impacts for these activities are employment and income increasing, these impacts are expected for every industrial activity.

Quarries have negative highly significant impacts on soil and landscape. These impacts are caused by removing the surface layer of land, also quarries may effect historical sites by destroyed some covering archaeological materials.

5.2.4 Agriculture and related Activities:

Agriculture and grazing are the main activities in the study area. Any improvement in these activities will reflect - as positive impact - on employment state and income of local population. The main problem that face agriculture and grazing in the study area is shortage of fresh water. A project for enhancement of use of the local fresh water resources will support activities of agriculture and grazing. These projects include water barriers, land reclamation, demonstration farms, and co-operative systems. We note positive impacts of agriculture improvement on culture. Indeed; the improvement of agriculture will help in income increasing and employment without changing in the style of local life. There are noticeable positive impacts for grazing improvement and land reclamation on soil and landscape. These positive impacts result from changing the wild desert to cultivated lands.

5.2.5 Tourism Actions:

Tourism actions contain tourism villages, hotels, restaurants, and natural parks. Generally tourism activities are chronic pollution source since it cause significant negative impacts on some environmental elements like quality of sea water, marine life, and grassland. Also there are significant negative impacts on man-made features by the potential exerted by tourism actions on the existing roads, existing water network, and

communications.

In other hand, tourism activities will increase the demand on the local products of food and other handicraft products. These impacts represent positive impacts on the existing activities, employment and income of local population.

The highly negative impacts for tourism are that in Culture State, a wide sector of tourists will be Egyptians and Arabs, other sector will be foreigners. The traditions of these sectors are different from the traditions of local people. The foreign life style is not necessarily better than the eastern life style but more attractive and dazzle. Tourism activities may replace the local culture by foreign culture.

5.2.6 Complementary Actions:

These actions include excavation, GIS centre, water authority upgrading, environmental monitoring, and social-cultural development centre. Most of these activities lead to reduction of the significant negative impacts of other activities. So, most of these actions have positive impacts on environmental elements and man-made features, the negative impacts of these activities are very small and can be ignored.

Chapter VI

Alternatives

This chapter introduces available alternatives for the different actions purposed in the ICAM plan. As shown in table. (1); alternatives vary in terms of their locations and/or their nature.

6.1 Transportation:

The alternatives for transportation upgrading are very limited. For example; the airport as a project has no alternatives in our case because the cabinet already approves its location and nature. The construction of this airport is in progress. Upgrading of railway and roads is also in progress, there are no alternatives of significant importance.

6.2 Urbanization and Services:

The upgrading of railway will be on the same track already existing. As for the roads the only alternatives are in terms of varying the shape and location of local road network. When we talk about urban and residential areas, including infrastructure and services. We have areas that already exist, and other that will be constructed and developed later on. The first type has no alternative except in the form of development yet the location is fixed. As for the second type it is free in terms of location and form. This will enable the chance of reducing the adverse impacts of such development.

As proper environmental assessment EIA can be undertaken before the development being carried out. Fresh water supplies in study area, for instance, come from the east through pipelines and El-Nasr canal. Their locations were chosen by planners and engineers of MIPW* and Matrouh Governorate. This means that there is no change of making major changes in terms of location and specifications. Possible alternatives may be to enhance these water supplies to give best productivity with minimum loss.

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* Ministry of Irrigation and Public Works

Table (6.1): The possible alternatives in study area

Actions	Location	Processing
Residential (1)	X	✓
Residential (2)	✓	X
Water supply system	X	✓
Electricity distribution	X	✓
Food processing	✓	✓
Light industry	✓	✓
Quarries	X	✓
Wood industry	✓	✓
Grazing practices	X	✓
Land reclamation	X	✓
Water barriers	X	✓
Tourism resorts	✓	✓
Hotels & restaurants	✓	✓
Marina	✓	✓

X No possible alternatives

✓ Possible alternatives

6.3 Industrial Development:

We can select suitable locations for new industries. Also, there are great potentials for upgrading and development the traditional industries and light industries such as food processing. The development of heavy industries can be an option, but their locations have to be away from other development.

6.4 Tourism:

Alternatives of tourism activities can be in terms of types. As for their locations, there is no option, particularly in early development stages, but to be on coastal areas. Concerning the types of tourism activities, tourist villages can be provided on hotel basis or be sold, as in the case of tourism villages located on the northern coast of Egypt. This type of villages was rejected by the planning team as it provides no year – long activities and does not allow for foreign tourism development. This means that there is no alternative for tourism villages on hotel basis.

Additionally, alternatives can be considered for the specific activities to be associated with tourism such as a marina, trips to historical sites,... etc.

6.5 Other activities:

There are some activities such as quarries and land reclamation for agriculture, which has to be situated in specific locations. These activities (e.g. quarries) cannot be transferred to other locations yet, they have serious environmental negative impacts. To reduce these impacts, the activities should be, assessed carefully and if it would affect other activities e.g. tourism, they have to be abandoned

Land reclamation can provide great potentials for achieving self sustained areas in terms of vegetables and fruits. It will provide played opportunities for the Bedouin and enhance the quality of life style in the area.

Suitability analysis based on GIS; associated with integrated coastal area management, can enhance a comprehensive vision of development in the study area. This vision must be taking into consideration when we attempt to deal, in some details, which is not the case with SEA.

Chapter VII
Mitigation Measures

This chapter will review, in some detail, specific project-related environmental impacts and, some of the mitigation measures that need to be considered in a proper EIA. Environmental parameters are attributes of the environment that may be measured quantitatively or defined qualitatively. These environmental parameters have been shown in impacts and importance matrices. Qualitative parameters include environmental attributes such as aesthetic quality, community (human).

7.1 Pollution

Pollution of the physical environment due to project activities, whether related to project development or during its subsequent operational existence, must be considered at the outset in each of the following areas. In the following, the expression "Regional" denotes to problems have wide effect on the study area. In other hand, the expression "Local" denote to limited – geographically or effectively- problems.

7.1.1 Air Pollution

Air pollution may be defined as substances present in the atmosphere in concentrations great enough to interfere directly or indirectly with man's comfort, safety or health or full use or enjoyment of his property, or injurious to other living creatures or plants." In terms of chemical composition, air pollutants fall into two categories: gaseous and particulate pollutants.

Categorized by source, pollutants can be classified as:

1. Point sources (large stationary sources);
2. Area sources (small stationary sources and mobile sources with indefinite routes);
3. Line sources (mobile sources with definite route).

Actions that Cause Air Pollution on Regional Level :

Many of the proposed actions - in the study area- cause air pollution. Highways, airport and marina are expected to be sources for Carbon mono- and di-

Oxide, Sulfur Dioxide, Hydrocarbon and Lead. Yet in open areas such as the case with our study area, that will not be such a serious problem.

Actions that Cause Air Pollution on Local Level:

Quarries, which located on the highways, are monopoly by Bedouins. The special products of these quarries are the sand for construction processes in the tourist villages. Quarries are the main source for dust in the study area, but their effects are limited to its locations. So, air pollution by dust is distributed as hot spots on the highways.

Mitigation Measures on the Regional Level: The following are some of the means available for the control of polluting discharges into the atmosphere, and thereby of their detrimental effects.

1-Reduction of pollutant discharge at the source by application of control equipment to remove gaseous pollutants are based mainly on the principles of absorption, combustion, and adsorption. These methods must used for any large-scale industry proposed in the study area.

2- Reduction at the Source: The most desirable mitigation measure is not to produce the pollution in the first place. Reduction at source can be achieved through raw material changes, operational changes, modification, or by replacement of process equipment. Also, fuel that used in the study area must be lead less.

Mitigation Measures on the Local Level: to reduce the air pollution that based on dust, quarries must be transferred out the study area, this need to build up a highways network to allow to producers to meet consumers.

7.1.2 Water Pollution

Water pollution may be defined as: "such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of any sewage or industrial effluent of any other liquid, gaseous or solid substance into water, that is likely to create a nuisance or render such water harmful or injurious to public health of safety, or to domestic, commercial, industrial, agricultural or other legitimate uses or to the life and health of animals or plants or of aquatic life."

The main sources of water pollution on Regional and Local levels:

The main sources of water pollution are as follows:

1. Sewage and other oxygen-demanding wastes which contain decomposing organic matter;
2. Industrial waste, which contains toxic agents ranging from metal salts to complex synthetic organic chemicals;
3. Agriculture waste, which comprises fertilizers, pesticides and biocides; and
4. Thermal pollution.

Actions which cause Water Pollution on Regional Level:

Water pollution can be released from many actions in our study area. Tourist village and residential areas will be the main sources for sewage.. Agriculture development will also release agriculture waste. These actions are distributed wide the study area. So, these actions cause water pollution on the regional level.

Actions which cause Water Pollution on Local Level:

Electric Power plant that found on the seacoast, cause a thermal pollution on a closed area from the sea at its location.

Mitigation Measures on the Regional Level:

1 Use of Treatment Process Equipment: Pollution control equipment should be operated in conjunction with an effective monitoring program. This equipment must used in the tourist villages.

2 Control of hazardous wastes, that may released from residential area and large scale purposed industry.

3 Plant Area Drainage: The plant surface drainage system should be carefully designed to prevent flooding of the plant area, and must be use the treatment equipment.

4.Solid Wastes: Industrial plants can usually dispose off non-hazardous organic solid wastes and refries most economically by means of sanitary landfilling, either by building/operating their own landfills or by contracting for this service with a municipal system.

Mitigation Measures on the Local Level:

Cooling water systems must be used with electric power plant, but plant cooling water systems sometimes are of the non-circulating type (single pass) which require huge

quantities of water to be extracted from a nearby surface stream and usually the returned to it. This returned water might contain a substantial amount of pollutants, which can be very difficult to remove because of the large volumes involved. Where re-circulatory cooling towers are used, various types of chemical compounds are added to the re-circulating water for purposes of slime and corrosion control and these usually contain toxins. Hence, a provision must be made for the removal of the toxins from the cooling tower blow-down and special care is needed to ensure that the system will be kept properly functioning to achieve complete treatment of all blow-down.

7.1.3 Noise and Vibration

Noise can be defined as an unpleasant or disagreeable sound, or sound without value, that causes discomfort to the listener. Another definition of noise can be "wrong sound, in the wrong place, at the wrong time." Noise pollution thus refers to unwanted sounds released into the atmosphere leading to discomfort and health hazards for human and animal life".

Noise and Vibration Sources:

1 Industrial: Any large scale proposed industrial actions may cause noise.

2 Construction Work: Fast urbanization calls for the construction of roads, bridges, and huge residential and commercial complexes. This has lead to a high level of noise pollution in large urban centers. Noise due to construction activities in areas inhabited by wildlife can cause serious disruption to habitation patterns.

3 Vehicular: Traffic noise is created by a continuous flow of vehicles and is generated by engines in jets, motors in trucks and cars and the contact of tires on roads and wheels on rails.

Actions that release Noise and Vibrations on Local Level:

Airport, marina, construction operations on residential areas and tourist villages are the main expected sources to noise and vibrations. All these activities are classified as local problems.

Mitigation Measures:

1 Noise Control in Industry: The reduction of noise at the source or insertion of a barrier between the noise source and the hearer (receptor) usually achieves Noise

control at an industry. The machine manufacturer usually does reduction of the source by modifying components or processes. Such as the use of belt drives in place of gear drives, welding in place of riveting, insertion of resilient damping material between impacting metal parts, reducing the response of vibrating surfaces by increasing the stiffness and mass, and reduction of air turbulence. Noise enclosures (barriers) attenuate noise by enclosing either the machine or the operator in an acoustically insulated environment. The enclosure should be as heavy as necessary to achieve the attenuation should be impervious to airflow, and the dimensions must be several times the wavelength of the frequency of sound. An absorbent lining should be provided to limit the increase of noise level within the enclosure resulting from reverberation. Partial enclosures on barriers are of limited use.

2 Noise and Vibration Abatement During Construction: Most abatement measures during construction are similar to those described above, i.e., they call for the use of sound barriers and noise reduction from equipment and vehicles. Additional abatement measures may be required in special cases, such as the use of vibration-free piling methods where conventional piling would be hazardous. Except in special situations, because noise and vibration from construction are of a transitory nature, no attempt is usually made to keep them below the threshold of human perception but rather an attempt is made to prevent health or structural damage. Thus, the key to control is effective monitoring and enforcement.

3 Noise and Vibration Abatement for Projects with Permanent Effects: Activities, which may affect the 'neighborhood' noise environment, can be many, from the local restaurant to market sounds to an airport. Most control measures are regulatory, including land use zoning and environmental quality standards for noise. Most abatement measures, which have been developed for noise and vibration for highway and airport projects, are applicable as well for other projects. These measures can be summarized as follows:

1. Acquisition of property to serve as buffer zone between the source and the receptor;
2. Construction of noise barriers or devices;
3. Noise insulation of public-use buildings such as schools and hospitals;
4. Management measures, such as prohibitions on certain types of vehicles for roads; time-use restrictions for industry, highways and airports; and flight

pattern restrictions for airports;

5. Improvement of equipment or vehicle structure;
6. Improvement of structural design, including buildings, airports, highways, railways and other structures, to reduce transmission of noise and vibration.

7.2 Mitigation Measures on the Natural Environment

Almost any development project will involve the disturbance of the natural environment. When the area involved is small, the environmental impact is likely to be minimal. However, the cumulative impacts of many separate small disturbances can be substantial. The kinds of alterations to the land that are of concern include clearing of forests, topsoil removal, grading, filling, draining, landscape planting, cultivation, paving, building construction and waste disposal. The direct and immediate environmental impacts of these alterations can be grouped into four categories:

7.2.1 Loss of Habitat:

Any of the activities listed above can result in a loss of habitat. The seriousness of the impact depends on the type of habitat being converted, as well as on the way in which the conversion is carried out.

7.2.2 Loss of Soil Productivity:

Certain forest soils, when stripped of natural cover, become laterized or subject to rapid erosion, and essentially unproductive. Removal of the topsoil during grading also reduces productivity. Soil loss through erosion has the same effect, and in addition may degrade water resources. Conversion of high quality agricultural land to urban uses also reduces productivity.

7.2.3 Modified Hydrology:

Clearing, grading, filling, paving or construction of buildings alter patterns of surface runoff and infiltration. The results of this include local ponding and flooding, increased flood frequency and/or magnitude downstream, lowered water table, diminished groundwater recharge, and reduced flows in streams.

7.2.4 Soil Contamination:

Soil can be contaminated through salinization if irrigation systems are not properly designed and operated. It can also be contaminated by the disposal of hazardous waste or improper operation of solid waste and land-based wastewater disposal systems.

7.2.5 Mitigation Measures:

When sensitive ecosystems are involved, the EIA should carefully assess the impacts, examine the alternatives that were considered, and perhaps propose new alternatives.

I. Appropriate catchment management is important for proper drainage, maintenance of groundwater and flood control. Careless development upstream resulting in the clearing of catchment areas can cause erosion and create flooding and siltation problems downstream as well as the reduction of dry season water flows. Cleared and sealed areas such as roofs, roads and paving deliver considerable runoff during periods of heavy rain.

2. Avoid construction on steep slopes, retain forest cover, stockpile and replace topsoil, conserve prime agricultural land, control erosion and sedimentation through use of mulch during construction. Rapidly replace vegetative cover on slopes and construct siltation basins and barriers of straw or filter fabric to protect waterways.

3. Use design and construction techniques to maintain or replace soil drainage channels and retention or detention structures to avoid increases in rates of runoff Take measures to offset reduced infiltration (porous pavement, infiltration ponds, etc.), and conserve open spaces on critical aquifer recharge areas.

4. Development of floodplains may result in loss of life and damage to property from floodwaters. Frequently flooded areas should be reserved for open space, recreation, wildlife or agriculture.

5. Design features to prevent disturbance of the flow patterns and hydrologic regimes critical to conservation of the ecosystem.

6. Enhance and/or protect other areas in substandard ecological conditions to offset losses at project site.

7. Construct artificial wetlands to replace areas lost due to project development.

8. Strengthen institutions to manage and protect land and water resources.

9. Include local NGOs in the institutional arrangements for ecosystem conservation.

10. Promote development of national wetland incentives and management strategies.

. Require wetlands concerns to be considered in national and local planning, laws, and decision-making processes.

11. Introduce environmental education programs to disseminate knowledge on the

importance of land resources and wetlands.

7.3 Social Environment

The construction and operation of a large development project has its negative and positive impact on the host community. In particular, if the community is small the project may totally disrupt their relationship with the ecology and deplete the resource on which they depend. It is important to identify the relationship between the community and their environment and assess how the project will affect the relationship.

A primary consideration in any assessment of social impacts is that personal, interpersonal, and institutional components of social life are strongly integrated. For the purposes of impact assessment, distinguishing two sources of social impacts - project level and action-level is useful.

Project level source: are social perceptions of the proposed project rather than actual action or activity undertaken as part of project development. At this level, the potential for impact arises out of the emotions triggered in individuals who perceive the proposed project as an intrusion into their lives. In some instances, the intrusion may specifically be perceived as a physical threat In others, the intrusion may be more generally perceived as a nuisance, an unwarranted assault on privacy, or even a flagrant reminder of social, economic, or ethnic prejudice.

Action-level sources: are objectively definable project related actions, activities and design features and attributes. At this level, which tends to receive the vast majority of the assessment effort, the focus is on the casual chains initiated by actual project development involving specific project activities.

The importance in distinguishing between these two levels of impact is that, unlike the physical environment in which impact must arise out of changes in the objective attributes of project activities, the social environment is subject to impacts arising out of the subjective workings of the human mind Some examples of personal and interpersonal impacts are discussed below.

7.3.1 Social Impacts and its Mitigation

Income Disparity: A local economic boom is likely to result in a relatively high rate of inflation that is not likely to affect the well-paid project worker but may quickly become prohibitive to the 'breadwinner' who is otherwise employed in the project area

but whose income remains fixed (e.g., a teacher, government employee, subsistence farmer).

Lifestyle impacts: Significantly higher project-related jobs may not only recruit local workers away from their previous work but may also serve as a model of an alternative lifestyle that directly contradicts local values and belief. Redirected values and lifestyles include not only those directly related to project-defined jobs, but also those related to project-related opportunities, such as drugs, prostitution and other criminal activities, each of which has important ramifications regarding public health and safety that may easily persist beyond the completion date of the project. Alternative lifestyles and values exhibited by imported workers may, of course, repel as well as attract local residents. These lifestyles may win new converts or reinforce historical barriers that effectively separate people, including differences in religion, ethnicity and race, as well as differences in behavior regarding the diverse necessities of daily life. When local residents as real threats, blasphemies, insults, or violence perceive such differences is likely to arise.

Interpersonal Impacts: Regardless of the personal impact on families, social impacts include interpersonal impacts that may arise from the removal of individuals from an ongoing social network. Depending on the attitudes, values, and behaviors of those persons to be displaced and of the community as a whole, the impacts removal of certain individuals from a locality may be viewed by the community, in some instances, as a positive reinforcement of shared community values and, in others, as quite the opposite.

Disruption of Community Values: The loss of structures and open areas within a community, as a result of project development, may also lead to a variety of secondary impacts, depending on the contribution of those structures and areas to both socially acceptable and deviant values and behaviors. Regardless of its primary use, a school, a place of religious worship, a governmental office, or even a privately owned business may also serve an important community values as a place of public assembly important for recreational and other neighborhood social functions. Although the relevant educational, religious, governmental, and business functions may easily be relocated without functional interruption, ancillary but no less economically significant neighborhood functions may not be as easily or successfully relocated. of course,

buildings and their associated properties as well as open areas may also be the ;its of behavior that is contrary to local community values.

Chapter VIII

An Outline of Difficulties encountered in The Preparation of Strategic Environmental Assessment Report

Environmental Impact Assessment (EIA) and Strategic Environmental Assessment (SEA) have arisen from the awareness of environmental protection necessarily. The law No. 4 for 1994 deals with the steps of EIA for new projects. There is no legal obligation to carry out SEA for new activities. Strategic Environmental Assessment is rapidly becoming an important part of the toolkit available to environmental management practitioners, communities, and decision-making authorities. This is a consequence of the inadequacies of project-specific EIAs and the need to address environmental issues in a pro-active, rather than reactive way.

Whilst SEA is an important tool to bridge the gap between planning and EIA, SEA does not attempt to replace planning and policy-making mechanisms. Instead, SEA is a step towards fully integrated planning which promotes and enhances sustainable development. Both EIA and planning techniques are converging towards the goal of sustainable development and SEA is an important step in that process. Local Agenda 21, for example, is both a form of SEA and an integrated, participative form of planning which promotes sustainable development.

8.1 GIS-based approaches

The use of map overlays to account for natural features in planning has a long history and is still important today. GIS technologies can be used to predict land use suitability and model the effects of different forms of development (for example, Armitage, 1995). This is a potentially powerful tool for SEA but is not strategic unless accompanied by stakeholder and community participation in the planning process. When applied to policies and plans, GIS-based approaches can also be used to test scenarios and predict cumulate impacts (for example, Sol et al., 1995). However, the team encountered a problem in obtaining maps on the study area that deal with specific

aspects. e.g. administrative boundaries, activities,....etc. this meant that the team has had to go and collect the information and data from the area. These information and data were then plotted on maps.

8.2 Lack of Information:

One of the most common problems for planners in Egypt is the lack of real-time information. Information about economic activities is dispersed between different sources, which sometimes present conflicted information. One of the largest information source is the Information and Decision Support Center (IDSC) located in Cairo and has a few branches in Governorates e.g. Alexandria. IDSC has plans to build complete databases to economic resources.

8.3 Lack of Cooperation:

It was found that there is a lack of and cooperation among authorities responsible in the study area. No clear and efficient communication lines exist. This did not help the team during its assessment of the ICAM plan.

The awareness for SEA and EIA must be based on people, responsible and decision-makers. This is a lonely way to avoid all problems that face SEA and EIA preparation.

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ANNEX III

CARRYING CAPACITY ASSESSMENT FOR TOURISM DEVELOPMENT

UNEP

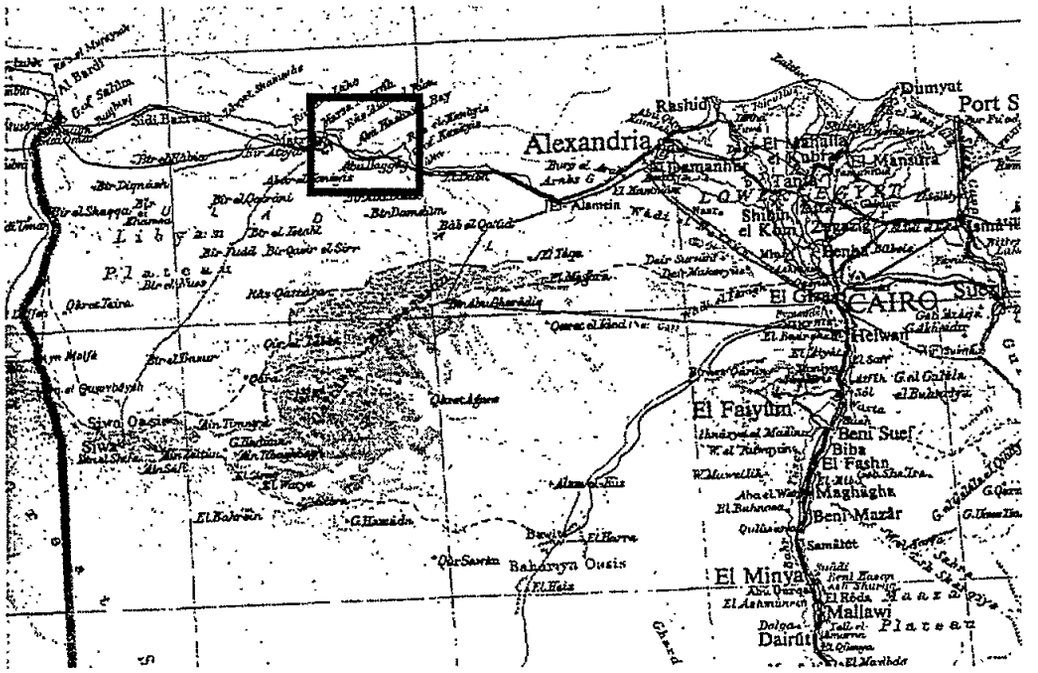
UNITED NATIONS ENVIRONMENT PROGRAMME
MEDITERRANEAN ACTION PLAN

MAP

PRIORITY
ACTIONS
PROGRAMME

Coastal Area Management Programme (CAMP)
FUKA-MATROUH - Egypt

CARRYING CAPACITY ASSESSMENT FOR TOURISM DEVELOPMENT



Priority Actions Programme
Regional Activity Centre
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ACKNOWLEDGEMENTS

This document was prepared in the framework of the MAP Coastal Area Management Programme "Fuka-Matrouh" Project. It was based on a number of sectoral studies, and particularly the Carrying Capacity Assessment Study prepared by the national team of experts from the University of Alexandria led by Prof. Mohamed El-Raey.

PREFACE

The "Tourism Carrying Capacity Assessment for the Fuka-Matrouh Coastal Zone" is one of the activities initiated through the "Coastal Areas Management Programme" (CAMP) for the state of Egypt as an input to the "Coastal Zone Management Plan of the Fuka-Matrouh Area".

- This work is being carried out by the Priority Actions Programme/Regional Activity Centre (PAP/RAC), as a part of the Mediterranean Action Plan (MAP).
- The national counterpart institution ensuring contacts and co-operation with various other governmental agencies is the Institute for Graduate Studies and Research (UNARC) on the University of Alexandria.

The Tourism CCA for the Fuka-Matrouh Coastal Zone is at the same time a part of the PAP/RAC's priority action "Development of Mediterranean Tourism Harmonised with the Environment" and represents a practical application of the "Guidelines for Carrying Capacity Assessment for Tourism in Mediterranean Coastal Areas" prepared by PAP/RAC.

- This Guidelines intended to be a comprehensive methodological document, a procedure for the analysis and assessment of carrying capacity, as well as an input to the integrated planning and management of Mediterranean coastal areas.

The team working on the "Tourism Carrying Capacity Assessment for the Fuka-Matrouh Coastal Zone" consists of five PAP experts and seven experts from the University of Alexandria. The five PAP experts are:

- Dr. Zoran Klarić, from the Institute for Tourism, Zagreb, Croatia, as the coordinator of the work on the study as well as of the whole PAP action "Development of Mediterranean Tourism Harmonised with the Environment";
- Dr. Panagiotis Komilis, from Centre for Planning and Economic Research, Athens, Greece, as the expert responsible for economic issues;
- Dr. Miroslav Dragičević, from Horwath Consulting, Zagreb, Croatia as the former coordinator of the PAP action "Development of Mediterranean Tourism Harmonised with the Environment" and one of the authors of the Report of the Mission Concerning the Tourism Carrying Capacity Study of the Fuka-Matrouh area, which has served as a basis of this study;
- Mr. Gojko Berlengi, consultant to PAP, Split, as the expert responsible for the whole ICAM project for the Fuka-Matrouh region and, therefore, for the inclusion of the CCA into ICAM project; and
- Ms. Feyza Surucu from Ankara, Turkey, who was involved in the previous phase of the work together with Dr. Dragičević.

Seven experts from the University of Alexandria are:

- Prof. Mohamed El-Raey, Dean of the Institute of Graduate Studies and Research, University of Alexandria, as the coordinator of the work of all Egyptian experts on CCA, and as the national coordinator for the activities on Integrated Coastal and Marine Areas Management (ICAM), Environmental Impact Assessment (EIA), and Geographical Information Systems (GIS);
- Dr. Ebtehal El-Bastawissi, specialist for tourism issues;
- Dr. Mohamed Abd El-Karim A. Abdrabo;
- Dr. Saleh Mesbah, also as the contact person and coordinator in the first phase of the work;
- Mr. Mamdouh Mohamed El-Hattab, also as the contact person and coordinator in the second phase of the work;
- Mr. Ahmed Shalaby; and
- Ms. Wisam El-Din Mohamed.

The Regional Activity Centre for the Priority Actions Programme of the Mediterranean Action Plan wishes to thank the University of Alexandria not only for their active involvement in the all phases of the work, but also for their hospitality during all PAP expert missions.

The PAP/RAC wishes to thank also the Land Use Planning and Environmental Management Centre (LUPEM) in Marsa Matrouh for their hospitality, help in provision of necessary documentation, assuring contacts with other institutions in Marsa Matrouh, and especially for the excellent guide on our visit, Mr. Ahmed Allam. Finally, we would like to thank His Excellency the Governor of Marsa Matrouh for finding time to receive Mr. Klaric and discuss the PAP work.

1. To offer a concept of a well balanced tourism development by identifying environmental and socio-economic issues and problems, and by assessing the resources and their interactions in the study area so that, at the same time, the needs of the population in the area will be fulfilled;
2. To present and promote this concept to local and regional authorities, entrepreneurs, planners and local population;
3. To prove the applicability of the PAP methodology for carrying capacity assessment for this area, as a representative for less developed Mediterranean countries facing challenges of fast and sometimes uncontrolled development; and
4. To serve as a model to other areas in Egypt, as well as in some other Mediterranean countries, or even countries outside the Mediterranean, as a pilot document for carrying capacity assessment.

The optimum carrying capacity for tourism for the study area had to be used also as an input for the coastal area management plan that will control and guide future potential tourism development in the study area.

2. PROBLEMS CONCERNING TOURISM CARRYING CAPACITY OF THE FUKA-MATROUH COASTAL ZONE

2.1. The Concept of Carrying Capacity

The concept of tourism carrying capacity is based on a general statement that any form of development within the carrying capacity of ecosystem means a sustainable development. That fits in a general definition of **sustainable development** as:

- **a form of development which uses the natural ecosystems as resources of production and consumption growth leaving them unchanged for the future generation,**

or, more simply, defines it

- **a development within the carrying capacity of ecosystem.**

According to such general definition of carrying capacity and sustainable development, **sustainable development of tourism** can be defined as:

- **a form of tourism development which uses natural resources and cultural heritage to increase the number of visitors and the profit from tourist activities, but preserves them for the future generations,**

or as

- **a development of tourism within the carrying capacity of tourist resources.**

The desirable sustainable tourism development functions as a kind of compromise between generally intensive forms of tourism development promoted mainly by investors/entrepreneurs and generally restricted forms of tourism development promoted mainly by ecologists. Such a methodology has a starting point in a view that the assessment of limits for carrying capacity can rarely be measured precisely – it is almost always judged subjectively depending on which view is represented by subjects responsible for the assessment.

Therefore the Carrying Capacity Assessment for Tourism by PAP methodology is based on two elements, that makes a difference from previous methodologies:

a) a flexibility of physical-ecological-infrastructural, socio-demographic and political-economic parameters, which need to have equal treatment; and

b) a necessity for the analysis of different scenarios before final assessment of the Carrying Capacity.

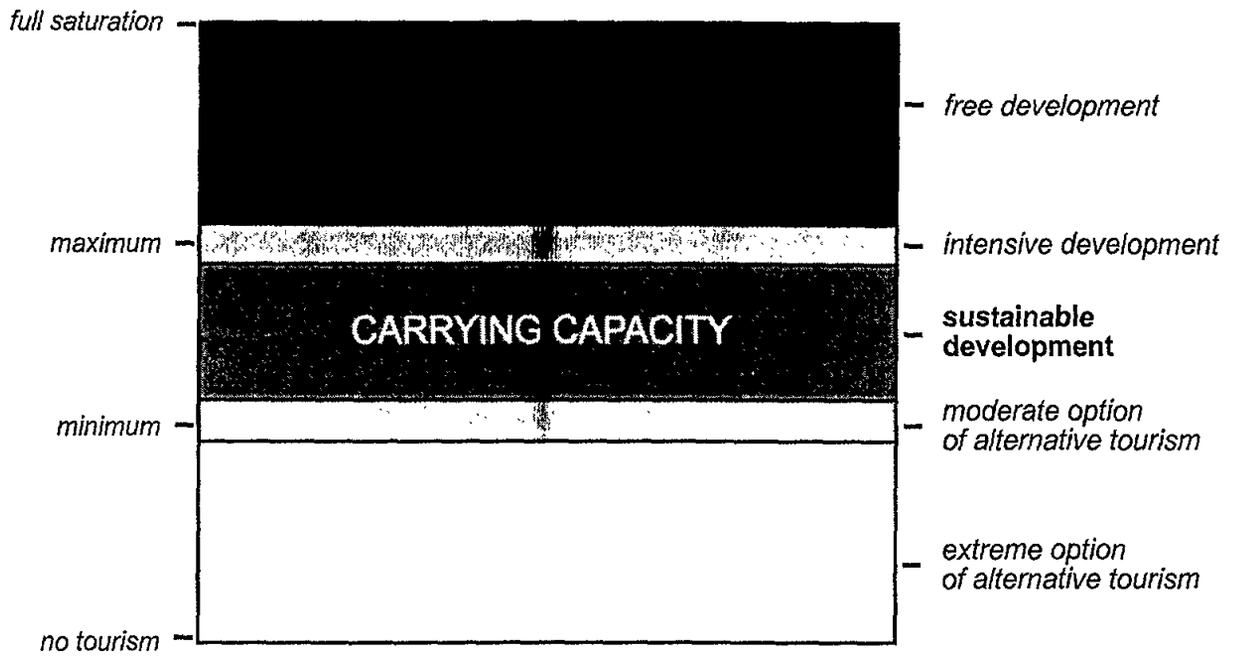

Diagram 1: Tourism Carrying Capacity Assessment According to PAP methodology

Such approach has been proved as the most useful in medium-size areas (regional level) and in medium and less developed areas in the Mediterranean, such as Fuka – Marsa Matrouh coastal zone. Although the PAP methodology is adapted to such areas, it can be also used in larger areas and in other coastal zones, but not in small areas (local level) and in non-coastal areas.

In spite of specific approach, such assessment of tourism carrying capacity follows the key procedure accepted by the World Tourism Organisation, represented in the WTO definition of tourism carrying capacity as **the maximum number of people that may visit the tourist destination without causing destruction of the physical, economic and socio-cultural environment and an unacceptable decrease in the quality of visitors' satisfaction.**

2.2. The Fuka-Matrouh Coastal Zone as the Subject of a Carrying Capacity Assessment

The issue of CCA together with that of "sustainable tourism growth" has been raised and discussed as a result of the fact that certain regions or areas (e.g. in the Mediterranean coastal regions) of intensive tourist visitation over the last 20 years have become less attractive; not only regarding environmental conditions (deterioration) but also due to the related fact of the reduction in the number of the "high budget tourists".

Such a development is due to excessive or intensive and ill-planned growth in the levels of urbanisation or development of these areas with the construction of numerous and densely built forms of accommodation (new apartments, hotels, private/secondary homes settlements, etc.) to cater for large numbers of tourists.

- In other words, we have types of construction development which did not consider various direct (e.g. on specific landscapes, fauna and flora) or indirect (e.g. increased wastes production/dispersal) circumstances.

Within the above context, the subject of CCA for the study area rises as a critical issue that should be considered, under current circumstances and development conditions, as a matter of priority. With regard to such circumstances and conditions, the area may be generally considered as being at an **"initial phase" of tourism development, particularly with regard to international tourism.**

However, the type of development observed over the last 3-4 years (tourist settlements catering mainly for the domestic market) in the study area, or in adjacent coastal zones (El-Alamein), raises questions as to whether and to what extent this type of development becomes, as the prototype of tourism development in the long run, counterproductive and/or conflicting to the area's tourist capability.

Although the subject of the CCA study pertains to a specific geographic area (the 70 km long and 10-15 km wide Fuka – Marsa Matrouh area) the incorporation and analysis of adjacent areas is considered necessary from an operational point of view, since these areas are organically/functionally related.

- An extended coastal zone from El-Alamein to the gulf of Agiba and the inland/continental part covering the Quattara depression and the Siwa oasis should be considered as the constituent parts defining a tourism region which pursues to offer an integral tourist product and image in the international tourism market.

Within this broader spatial context and drawing on the preceding conceptual analysis of carrying capacity issues, the subject under investigation should embrace ideally the analysis of three interrelated dimensions of the determinants of capacity.

The **physical dimension** involves determining and specifying capacity in terms of **physical limits to output**; i.e. limits on a defined output which is considered as the number of people/visits or visitor days per time period at a particular resource.

- From an **operational** standpoint physical capacity limits are determined and/or imposed within specific institutional and legal frameworks applied in relation to the characteristics/properties of environmental (natural or socio-cultural) attractions and to specific tourism activities (e.g. outdoor recreation, sightseeing, etc.)

The **economic dimension** focuses on determining the capacity output from an economic only point of view in cost terms; i.e. by investigating from the supplier's side, whether productive efficiency of tourist enterprises at each output level is maximised while unit costs are at their lowest possible level.

- In **operational** terms this dimension of capacity is difficult to assess due to the lack of information and/or since many of its determinants (technological and economic factors) are outside the control of the suppliers.

The **social dimension** pertains to delimiting the Socially Optimal Visitor Flows (SOVF), i.e. a measure of capacity that is assessed by considering both costs and benefits incurring to the host community (individuals and public institutions) from different or alternative levels of output.

The data or information inputs required for assessing capacity levels particularly with regard to dimensions (b) and (c) are very high. Due to the very limited data available, apart from the economic dimension, there are formidable difficulties regarding the estimation of social costs and benefits of different/alternative tourist flows on different levels of output.

- A particularly useful information regarding this dimension, namely opinions/proposals of various social groups and experts, derived from specific surveys, is also lacking.

With an emphasis on the physical dimension[1] relevant to the subject of CCA, information inputs employed related to and elaborated in the following analysis of the methodological approach used, pertain to:

a) statistical data and cartographic material (both limited);

b) ICAM plan documents/reports (by specific terms or persons); and

c) information based on observations and discussions with the relevant authorities during visits to the area.

2.3. The Methodology Used in the Carrying Capacity Assessment

Having in mind the "Guidelines for Carrying Capacity Assessment for Tourism in Mediterranean Coastal Areas", the Tourism CCA study for Fuka-Matrouh coastal zone is based on the following starting elements:

- multifacied nature of tourism, which is always dependent of the given time and space;
- type, size and vulnerability of the tourist attractions;
- types and level of tourism development;
- relationships between macro and micro tourism policies; and
- the preferences of local population.

The contents of the study follow the methodology of the Guidelines, meaning four main phases of the work:

1. Documentation and mapping phase;
2. Analysis & synthesis phase;
3. Tourism development options; and
4. CCA formulation phase including the proposal of physical distribution of tourism development.

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[1] Capacity defined in physical terms is a significant input for environmental conservation and also from the standpoint of developing and managing tourist attractions.

The Data Collection

The data collection included the review of all available documents and materials, as well as field work. The documents included various statistical materials, already finished and on-going documents regarding the area (LUPEM projects, ICAM documents), brochures, etc. The field work included several trips made by UNARC experts, including the Questionnaire of Local Population, and three missions by the PAP staff in July 1993, May 1996 and May 1997.

The Data Analysis and Synthesis

The Data analysis includes a review of all collected materials in four steps in a way that three main groups of parameters according to the Guidelines (physical-ecological-infrastructural, socio-demographic, and political-economical) are analysed. This is organised in four steps:

- **Step one:** A brief review of existing literature on carrying capacity assessment for tourism development.
- **Step two:** A study of the physical characteristics of the area including the geomorphology, the climate, the soil, the natural water resources, and the fauna and flora.
- **Step three:** A survey of the infrastructure provision in the area including water and power supply, sewage collection and treatment, solid waste disposal, and transportation.
- **Step four:** An investigation of educational and health services, human resources, as well as the economic activities undertaken in the area, and the reaction of local people to the tourism industry (through a field survey and interviews).

The data synthesis deals with the key problems deriving from the analysis, including four main groups of problems:

1. Issues of management and protection;
2. Tourism demand and development (choices relative to domestic, Arab and Western markets);
3. Possible alternative approaches to tourism development; and
4. Land-use planning policy and development implications.

Tourism Development Options/Scenarios

Data analysis and synthesis are leading to the crucial part of the carrying capacity assessment, which is the preparation of several possible tourism development scenarios, which have to be analysed in order to achieve the most realistic option as a basis of carrying capacity. Four possible scenarios can be defined as:

1. Tourism development without restrictions and control based on domestic large and small scale investments (continuation of existing trends);

2. The option of free transfer to commercial interests for overall development predominantly by foreign entrepreneurs;
3. Alternative tourism option (strict conservation, immediately); and
4. Sustainable tourism development option.

Although all four scenarios fit in the general scheme of CCA according to PAP methodology, they have some specific characteristics due to the existing situation in the area. Namely, the first scenario is more environmental unfriendly than the second one due to a rapid growth of the so-called tourist resorts (secondary residences resorts) which can definitely destroy the tourism resource basis in the whole region. At the same time, in spite of possible large foreign development projects such as in Turkey or Tunisia, the second scenario is less dangerous due to a pure economic need of larger free spaces and beach areas.

Furthermore, the third scenario is more of a theoretical one, because the actual political situation does not allows strict protection measures, although it should probably be the best solution from the ecological point of view. Therefore this option does not deserve a wider explanation.

CCA Formulation Phase Including the Proposal of Physical Distribution of Tourism Development

CCA formulation phase is based on the sustainable development scenario as a result of a compromise between the need for protection of tourist resources and reality in the area. In the case of the Fuka-Matrouh coastal zone it is evident that the achievement of the sustainable tourism development scenario depends primarily on political decision. That means that physical distribution of tourism development had to be adapted to the existing physical distribution of the so-called "tourist resorts", which have already occupied (or will in the near future) the most attractive parts of the coast.

Therefore the structure of tourism accommodation capacities, as well of tourism services and support activities, **is not the most desirable one, but the one which is realistic in the actual circumstances.** The same statement concerns tourism development programme proposal in space and time.

2.4. The Carrying Capacity Assessment of the Fuka-Matrouh Coastal Zone as a Part of Integrated Coastal Area Management (ICAM)

Since the CCA for the Fuka-Matrouh coastal zone is being prepared simultaneously with the implementation of the Coastal Area Management Programme (CAMP), their results should be integrated in order to be able to respond to the requirements of sustainable development of the area. The inclusion of CCA in the process of integrated planning and management is a necessity without which there is no successful tourism nor economic development of the area.

3. DATA ANALYSIS

3.1. The Position of the Fuka-Matrouh Coastal Zone in the Matrouh Governorate and Egypt

The coastal area of Fuka-Matrouh is located in the north-western part of Egypt on the southern Mediterranean. It represents the most populated and economically most important part of the Matrouh Governorate. The Matrouh Governorate has an area of 212,112 sq. km (second largest in Egypt) and 193,000 inhabitants, or 0.9 inhabitants per sq. km in 1991. It represents 21.2 percent of the territory, and only 0.4 percent of the population of Egypt. The most of the territory is desert, with the population concentrated almost entirely on the coast, with only exception in the Siwa oasis.

The town of Marsa Matrouh represents more than a half of the population of the Governorate, and is the only important town on the 500 kilometres long stretch of the Mediterranean coast between Alexandria and the Libyan border. The town of Marsa Matrouh is located 290 kilometres from Alexandria and 540 kilometres from the Egyptian capital Cairo. Three other important towns of the Governorate are Saloum near the Libyan border (220 kilometres), El Alamein between Marsa Matrouh and Alexandria (180 kilometres), and Siwa in the Sahara desert (300 kilometres). Marsa Matrouh, Saloum, Siwa, as well as Sidi-Barrani El-Dabaa and El-Hammam are district centres.

The Matrouh Governorate and the North Western or Western Mediterranean Coast of Egypt are among the most important development regions in Egypt. This importance is derived from the important resources available in the region and relatively low population density, as well as the level of tourism development. These resources could provide great development potentials for the region to become one of the most productive regions of Egypt.

Due to a extremely high population density in the Delta and near the Nile river with nearly 400 inhabitants per sq. km, the Matrouh Governorate is becoming a region of very strong immigration from those areas, with the fastest growth rate in Egypt after the Sinai peninsula. In the Matrouh Governorate it is about 4 percent per year (in the North Sinai it is about 6 percent, in the South Sinai 8 percent, and in the whole Egypt 2.4 percent per year).

For such development, efforts to be productive and to avoid adverse impacts on the resources of the area, and on each other, long-term management and planning have to be conducted prior to any development. Otherwise, incremental development will take place and result in various negative impacts on the environment of the region, and consequently reduce significantly the possibility of achieving sustainable development of the region.

3.2.3. Climate

The study area has a semi-arid Mediterranean climate. The summer season, which extends from May until September, is characterised by clear sunny sky and no rain. The winter season, starting in October up until March, is mainly windy with certain periods of heavy rains.

Rainfall

The amount of rainfall in the study area is approximately 140 mm/year. Most of the rainfall occurs in winter with maximum in December (in Matrouh 38.7 mm) and January. The summer seasons are virtually dry (March to September 0 mm). Rainfall variability is high as it is in other arid climates.

Air Temperature

The summer and winter monthly averages of air temperatures do not reach extreme values. In Marsa Matrouh and El-Dabba (boundary location of the study area) minimum monthly averages of air temperature are reached in January (8.4 °C and 7.3 °C respectively); maximum in July (Matrouh 29.1 °C), or in August (El-Dabba 29.9 °C) (Figure 3).

Relative Humidity

Relative humidity averages between 60% and 75% all year round, in the climatological stations in the area (Dabaa, Ras El-Hekma and Matrouh city), and is thus always within the comfortable limits.

Wind

The prevailing wind is usually north-western, usually strong in the winter season, blowing at a speed of about 22 km/hour in January. In October, and over the fall season the wind speed decreases to about 15-17 km/hour (Figure 4).

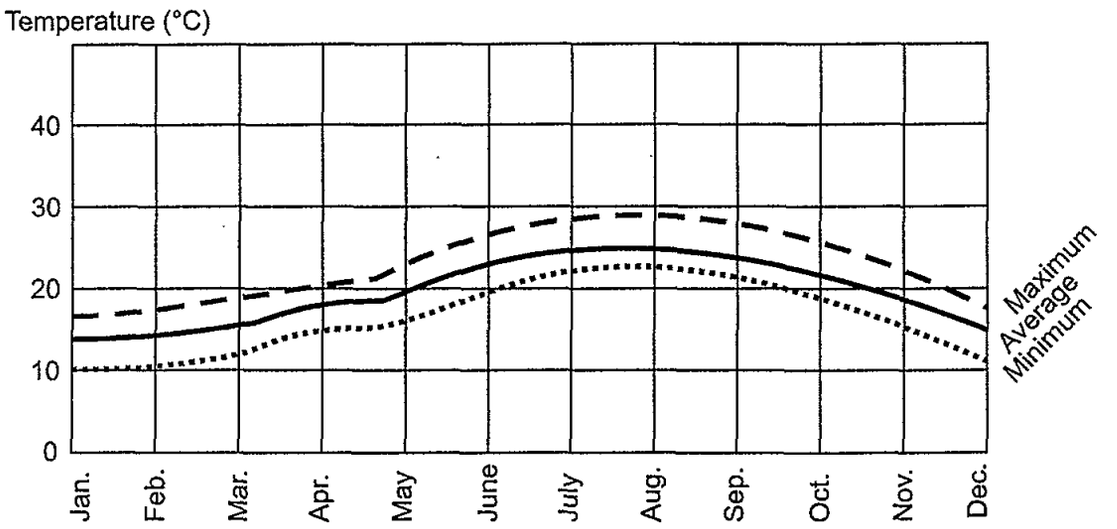

Figure 3: Average Temperatures in Marsa Matrouh

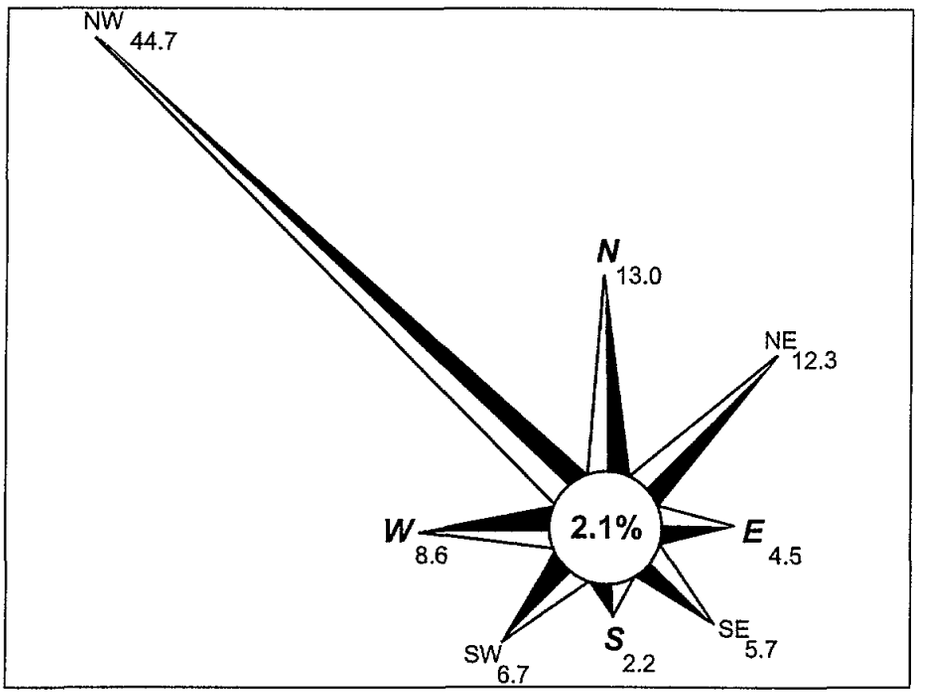

Figure 4: Wind Directions in Marsa Matrouh

3.2.4. Soil

The soil of the study area is essentially alluvial, so the beaches are composed mainly of well polished, round, white and loose carbonate sands. The loose carbonate sands, moving in the inland direction, gradually change to fairly consolidate limestone forming ridges that skirt the coast. The ridges are of marine origins in the form of bars and depressions that has a consequence in many lagoons. The depressions close to the shore are salty and therefore unsuitable for cultivation.

The coastal plain consists of sandy loam soils with some scattered loamy-sand. The salt was found to have considerable effect on tableland soils, which are mainly loamy and loamy-sand, underlain with alternating strata of limestone and shale. The profile of the soil is medium to shallow in depth. The soils of the wadies, which run through the tableland, consist of loamy deposits and are suitable for cultivation.

According to USDA American style, the soil of the study area was analysed and classified according to its type and potentials for reclamation. Generally, it was found that the type of the soil of the study area is of the third grade near the coast between Fuka and Garawla. Also, to the east of Garawla the soil is of the fourth grade in limited areas. As for the sixth grade soil, it was found in the area between Bagoush and Fuka.

3.2.5. Flora and Fauna

The study area is considered as one of the richest phytogeographical regions of Egypt with about 1,000 plant species representing some 50 percent of the total number of plant species in Egypt (Ayyad, 1995).

The fauna of the study area can be categorised into three main well-defined physiographic zones:

- the first are the coastal sand dunes;
- the second is the salt marsh depression; and
- the third is inland non-saline depressions.

It is argued that the coastal sand dunes ranging between the sea shore and the Maryuit salt marshes are characterised by more humid environment, more friable soils and dense vegetation, have a richer fauna.

3.3. Existing Infrastructure and Constraints upon Opportunities for Development with Special Accent on the Problem of Water Supply

3.3.1. Natural Water Resources

The rain water has two main features: the surface water flow (runoff) which has been estimated in the Fuka and Ras El Hekma region as much as 2.12 million m^3, and the underground water generated from the rain which has been estimated at 5.93 million m^3 annually, of which about 97,500 m^3 are already currently used per year. The amount of groundwater which could be utilised has been estimated at 2.5 million m^3, i.e. there are about 2,420.500 million m^3 of unutilised water annually.

The general feature of groundwater is that it occurs under both artesian and non-artesian conditions. However, all the groundwater is suitable for agricultural and domestic uses occurring in relatively shallow non-artesian aquifers and in small shallow semi-perched aquifers with slight artesian pressure. Relatively large quantities of groundwater are found at the depth in rocks ranging in age from Cretaceous to Miocene, but the quality of water is brackish to highly saline and is not usable.

The non-artesian aquifers can be found in the coastal plain in Miocene, Pliocene, Pleistocene and recent deposits cropping out at land surface and being recharged directly by rainfall and the infiltration of surface runoff. The non-artesian groundwater in the coastal plain can be found as a main watertable, coastal dunes watertable, and semi-perched watertable. Each one has its own characteristics.

The depth of the watertable varies from less than 1 meter to more than 50 meters, depending upon the relationship between topography and hydrology and upon the season of the year. In the internal plain behind the coastal dunes, the watertable is generally less than 5 meters below the surface. In the coastal dunes, the depth of the watertable generally ranges from 5 to 10 meters below the surface, depending upon the height of the dunes. The depth of the watertable in structural basins varies according to topography and the depth of the subsurface confining layers. Where locally perched watertables occur in wadies, the depth of water is generally less than 10 meters.

The quality of water in several aquifers in the region varies widely. It also varies with seasons, being the best immediately after the winter rains and the worst in the late autumn before the beginning of the rainy season. Water from the main watertable aquifer may contain as much as 20,000 PPM total dissolved solids or less than 1,000 PPM. In the alluvial sediments near the coast, the water quality is more uniform having commonly less than 3,000 PPM. In the coastal dunes, water often contains less than 1,000 PPM. Water from the structural basin is commonly good, but the locally perched aquifers in the wadies commonly contain water high in total dissolved solids (Eid, 1988).

Finally, it can be argued from the above information that the study area suffers from the lack of water resources to some extent. Such situation is thought to be not only a major problem with respect to sanitation and health, but also a constraint to the development plans for the region.

3.3.2. Water Supply

Generally, it was concluded that urban areas of the region depend upon two main sources of water needed for domestic uses, represented in:

1. The pressurised water system which is provided from Alexandria and which supplies urban centres along the region with water through extensions of pipeline from Alexandria. The treated water is pumped from the Alexandria distribution network into two pipelines running parallel through the Governorate to the city of Marsa Matrouh. One of them has a diameter of 700 mm and the other of 1,000 mm. Twelve pumping stations on the pipeline are used to pump water from Alexandria.
2. Desalinisation stations: there is only one desalinisation station in the study area located in Matrouh (Ayyad, 1995).

Meanwhile, the rural areas of the region depend on natural resources of water needed for various activities including domestic ones. The residents of the region used to restore rain water in Roman reservoirs. The region of Ras El Hekma and Fuka has about 47 Roman reservoirs, of which only about 37 can be used.

Based on the estimated population growth, the total population residing in the vicinity of the pipeline between El Alamein and Marsa Matrouh in 2010 is estimated at 64,000 persons in winter and 78,000 in summer. The total supply of water required is estimated at 8,000 m^3 per day in winter and 10,600 m^3 per day in summer.

The need was stressed for digging more deep wells to be used for agricultural activities and for applying the modern and water saving irrigation techniques.

3.3.3. Power Supply

Generally, the region was suffering from a shortage of the power supply and depended upon the local power plants for generating the needed power supply. The natural gas was used to operate the local power plants. It was reported that the local power plants were producing 60 MW, the cables were in a poor condition

and caused frequent electricity cut-offs. In spite of 20 percent of the generated power supply utilised it was not sufficient to cope with the development requirements. In 1996, the whole system was connected to the interconnected network which will transmit power to Libya, generated at the Aswan Dam. High voltage power poles have been erected along the coastline. Power supply system services of the study area are provided by the national authorities.

It is thought that such an improved situation may accelerate the development of the region, in particular the industrial one. It was discussed that, in addition to the traditional power sources, there are some renewable power resources which can be economically and widely used to provide more of power supply, such as wind and solar energy.

3.3.4. Sewage Collection and Treatment

The so-called "tourist resorts" (secondary residences resorts) along the coastline do not have any sewage systems or treatment plants. Sewage is collected in septic tanks and it percolates through sand and likely reaches the beach. Septic tanks are used in Marsa Matrouh, too. However, the construction of a sewage collection and treatment system began in 1991 and is expected to be completed in 1998. The collection and treatment system will have a capacity of 50,000 population equivalent. Sewage and treatment services are provided by the city council. So far, the waste in towns is discharged directly into seeks and the population practices no sanitary sewage disposal except a few who have private separate units (El-Naggar et al, 1988).

3.3.5. Solid Waste Collection and Disposal

Garbage from houses used to be collected by the Matrouh City Council and until recently it has been offered to a private company to conduct this task. Although the collection in Matrouh seems to be satisfactory, there is an urgent need to control such activities through allocation of planned dumping areas in order to avoid the adverse impacts of haphazard disposal of solid waste associated with the enlargement of urban areas and increasing quantity of garbage.

3.3.6. Transportation and Communication

The general situation with road network is very good, since there is a coastal highway between Alexandria and Marsa Matrouh, which is continuing further on towards Saloum and Libya. This road extending for 470 km from Alexandria to Salloum, with 22 m width, is an important development factor especially since its widening into four-lane highway. This road also provides a transportation link from Matrouh to the Delta and Nile Valley via Alexandria. It is expected that with further development of the economic base of the Matrouh Governorate this road is becoming an axis for more intensive exchange with Libya and transit trips between North Africa and Egypt.

In addition, there is a single line railway of fourth degree, which is currently developed to be double line. This railway, which connects the Delta and Alexandria with Matrouh and El Salloum passing through the region, serves primarily for

transportation of goods and water to far areas. It also carries passengers to Matrouh in summer.

There is an airport in Matrouh, which belongs to the military forces. The National Authority for Civil Aviation leases the landing rights for civilian use during the summer (from June to October). The airport is considered as an important link for rapid transportation to the rest of the country.

It was reported that there was a microwave network covering the whole Mediterranean coastal region from Alexandria to El-Salloum, with connecting stations at 50 km distance from each other.

3.4. Basic Demographic and Economic Data about the Fuka Governorate and the Fuka-Matrouh Coastal Zone

3.4.1. Population

According to the 1986 Census, the study area had 53,711 persons which represented 35.5% of the total population of the Matrouh Governorate, about 48% of them being female.

Concerning population increase, it was found that certain sections of the study area have experienced increases in their population size. During the period 1967-1986, areas such as Ras El Hekma and Sidi Henish have had population increases of about 75.8% and 128.6%, respectively. Other sections, meanwhile, have experienced a decrease in their population. For example, the population of Grawla has declined slightly, by 3.9%, while Fuka has experienced a population decline of about 28.7% over the same period. Such differences in population trends can be attributed mainly to the dynamic nature of the Bedouins, the main residents of the region, rather than to natural forces or in-migration from other areas.

Concerning the educational status of the population, it was found that about 14,891 persons were illiterates which represent as much as 41.8% of the total population of the region. The illiteracy rate varied widely among different sections of the region, for instance, it reached as much as 88.3 % in Grawla compared to just 37.6 % in the Matrouh city. The illiteracy rate was much higher among women - 52.3%, 88.5%, 88.6%, 96.1% and 97.6% in Matrouh, Sidi Henish, Ras El Hekma, Grawla and Fuka, respectively. It can be argued that such a high illiteracy rate among women is mainly a result of traditions and customs prevailing in the region (the Bedouin community) which consider there is no need for educating women.

The illiteracy rate is the lowest in the Matrouh city (37.3%), because Matrouh is the capital of Governorate and most of educational services would normally be concentrated there. Also, the nature of urban population differs from Bedouin people in the surrounding rural area. Moreover, it was suggested that about 16.5% of the total population in the area can only read and write. This means that about 85.3% of the population in the region have no or limited educational level.

Concerning the age structure of the population, it was found that about 46.6% were 15 years old or less, 49.4% were 15-60 years old and 4% were 60 years old or

more. It means that the population of the study area is young, i.e. the young people form the majority of the region population.

About 80% of the population is concentrated in the Matrouh city and the remaining 20% of the population is dispersed along the other parts of the region. Such concentrated population reflects centrally distributed services.

3.4.2. Educational and Health Services

It was reported by the Matrouh Governorate that the total number of schools in the Matrouh Governorate reached 233 in 1993. Most of them are primary schools (174), with 1270 class rooms and 1858 teachers.

Table 1: Number of Students and Schools in the Matrouh Governorate During 1993

Stage	Primary	Preparatory	Secondary		Total
Item			Gen.	Art.	
No. of students	23,551	9,050	1,778	1,649	36,028
No. of schools	174	43	11	5	233
No. of class rooms	854	280	58	78	1,270
No. of teachers	1,113	457	1,760	162	1,858

Source: Information and Decision Support Centre, Matrouh Governorate

The health services existing in the project area and its surroundings are represented in a general hospital and two specialised hospitals in the Matrouh city. Additionally, there are 4 clinics, 7 village centres for health care and a family planning Centre. In the Dabaa area, there are one central hospital, three village centres, and a family planning Centre, while in Negela there is only one village Centre.

3.4.3. Economic Activities

It was estimated that about 80% of the Bedouins were involved in sheep and goat herding and the cultivation of barely, vegetable and trees. Additionally, about 15% depend on commerce as a source of income, while the remaining 5% work in different jobs for the government and the private sector.

Animal husbandry is traditionally the major, and most common economic activity of the Bedouins in the region. It was estimated that about 30-80% of the gross income of the population in the Matrouh Governorate is earned through this economic activity.

Generally, the agricultural activities in the study area are scattered and depend upon rainfall. Also, they are considered as self sufficiency economic activities. It was estimated that the total cultivated area in Matrouh and El Dabaa including the study area is 110,834 Feddan in 1993. (Information and Decision Support Centre, Matrouh Governorate, Undated).

One of the most important crops that are used to be cultivated in the study area are fruit trees that are mainly represented in olive. Olive cultivation is not

considered an economically attractive activity, because olive trees are often planted in marginal areas, where no other crops can be grown. They recover easily from drought and have a long productive life span of more than 50 years. However, by applying the available cultural techniques properly and by carefully selecting the site and the plant material, olive trees can produce a good crop and are no less profitable than any other fruit tree. It was estimated that the total olive production in the north-western coastal zone in 1984 was 6,000 tons. Barley is another main crop which is used to be cultivated in the study area.

Fishing is a minor activity in the region. The Bedouins have a distinct preference for meat over fish, and the local population is not marine-minded. Besides, landing and ship-servicing facilities are still very limited, and not expected to contribute to the region's development in the near future. However, there is an urgent need to a comprehensive survey that should be made in order to define the capability of the fisheries in the region, as well as the sustainable yield.

Generally, it can be concluded that the study area can be divided according to the activities which occur within it, into three main regions as follows:

a) The coastal cultivation strip which extends from the shoreline 5 to 10 km inland, including the beach and the coastal plain. Cultivation of orchards and vegetables predominates especially in deltas of wadies in which the inhabitants are settled. It represents about 5% of the total land;

b) Inland mixed production, grazing/cropping strip which is located south of the coastal strip, between 5-15 km from the coast and where the soil is poorer. Grazing (especially sheep and goats) and cropping are the main activities. It constitutes 22% of the total land; and

c) Inland grazing (rangeland) strip which lies between 15 and 50 km from the seashore. Grazing predominates, with some cropping. It constitutes 73% of the total land.

The study area is characterised by relative absence or a shortage in the industrial activities. In 1980/81, it was estimated that the total value of industrial production in the Matrouh Governorate is as much as 0.7% of the total industrial production in Egypt. This can be taken as an indication to the lack of industrial activities in the Governorate as a whole. The industrial activities prevailing in the study area are represented in small business and handicraft that are related to the tourism activities.

Tertiary economic activities are mainly represented in the tourism sector. Generally, the tourism activity prevailing in the study area and the Matrouh Governorate is seasonal tourism which relies on the beach attractions in the summer period.

3.5. Main Tourism Development Patterns of the Fuka-Matrouh Coastal Zone with Respect to Tourism Carrying Capacity Assessment

3.5.1. The Natural Attractions

The natural potentials for tourism development in the study area lie in its shoreline configuration and its moderate weather. The shoreline is characterised with successive bays and heads composed of "rocks" (the major of these is Ras El-Hekma). There are many beaches of fine white sand, the water is very clear and has a lovely turquoise colour. The water is not that deep, with a gradual slope which allows for safe bathing.

The weather is moderate reaching its highest temperature of 28.5 °C during August and its lowest 10.2 °C during December and January. Although the average rainfall in the area is one of the highest in Egypt, it reaches only 147,1 mm/year, with the greatest rainfall during January and practically no rain in the summer period.

The study area is one of the most attractive on the Egyptian Mediterranean coast. It is accessible through secondary roads from the high way, but still inaccessible for a great part offering a unique opportunity for isolation. Some parts of the study area could be announced as protectorates for their outstanding beauty and/or unique features (Head of Ras El-Hekma, Hamam El-Amiratt).

In Marsa Matrouh itself, the natural bay and the long white beach make it good for sunbathing and swimming in calm transparent waters. Good bathing spots nearby include the outstanding beach at Al Obayed and Ageebah, as well as Cleopatra's Bath, a rock-hewn whirlpool bath offshore which was supposed to be used by Anthony and Cleopatra.

3.5.2. The Cultural attractions

The area is enriched with historic sites and monuments that could attract tourists. Close to Marsa Matrouh there is a Rommel's Hideout, a cave where the general planned his military campaigns and which has now been turned into a military museum as the only cultural monument in the area equipped for tourist visits. Other potentially interesting cultural monuments include a ruined temple fort built by Ramsis II, an early Coptic chapel, a shipwreck of the old Egyptian fleet and some remnants from the Roman period, but they are not equipped for tourist visits.

Some Bedouin villages, such as Fuka are potentially attractive excursion points from the socio-cultural point of view, if some tourist facilities could be organised there (souvenir shops, restaurants, etc.).

About 180 km towards west from Marsa Matrouh around El Alamein there are the cemeteries of the World War II soldiers. This attraction is already well visited every year by tourists, relatives and friends. About 300 kilometres towards Southwest is the Siwa oasis with remarkable antique monuments (the crowning hall of Alexander the Great, pharaonic tombs) located in a unique desert oasis environment. The Basic Characteristics of Tourist Supply

In the whole Egypt accommodation capacity in hotels has almost tripled in ten years (1985-1995) from 24,000 to 70,000 rooms. After Cairo, Alexandria is the second in hotels and rooms capacity. However, the relevant information on actual capacity covering the entire accommodation sector (apart from hotels, cruise ships and mainly tourist villages) is scarce and sketchy as it has been noted elsewhere[2].

The bulk of the new accommodation development is geared recently towards sun and beach resort holidays, taking place mainly in the Red Sea and the south of the Sinai/Gulf of Aqaba regions. The state's steady withdrawal from hotel management and recent hotel privatisation policies together with investment encouragement seem to have contributed to the accommodation capacity increase.

The overall picture of the existing Egyptian Tourist Product can be delineated on the basis of its spatial structure and its main product line (tourist attractions) features and differentiated into two broad categories:

- The Nile valley corridor with tourist activities pertaining mainly to visits/touring traditional historic sites and antiquities, as well as contemporary urban attractions; and
- Three coastal regions:
  - The **Red Sea** (Hurghada, Safaga, Al Qossier);
  - The **Gulf of Aqaba** (from Taba to Sharm El Shiekh); and
  - The **W. Mediterranean** coastal region (from Alexandria to the Libyan border) encompassing the **study area of Fuka-Matrouh** with main attractions, the sea/coastal resources - beach and sun holidays.

It was estimated, by the TDA, that the Matrouh Governorate had, by 1993, 72 hotels with a total number of 3140 rooms, and 15 tourist resorts, as well as 29 youth hostels with a total number of 1317 rooms.

Unfortunately, it was not possible to collect the data about the number of tourists/beds in so-called tourist resorts (secondary residence resorts), because they are closed for non users. Considering their extremely huge scale it can be estimated that the number of beds in those resorts is minimum 30,000, if not more than 40,000[3]. If most of the already licensed resorts are to be built, the total number of beds in those resorts will surely reach more than 100,000, if not even more (according to unofficial information there are about 40 new planned resorts), what can seriously endanger the future commercial tourist development and, therefore, the resource basis of local economy.

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[2] Economist Intelligence Unit, International Tourism Reports, No 2, 1996.

[3] The average number of beds in all so-called tourist resorts is estimated at minimum 2,000 beds, although this number varies a lot by each resort depending on their demand – in better establishments it is probably lower due to a more dispersed structure, and in those built for lower class the demand is probably greater.

3.5.3. The Basic Characteristics of Tourist Demand

With regard to the overall evolution of demand in Egypt, one observes the **doubling** of visitor arrivals between 1985 (1,520,000) and 1995 (3,130,000). Worth observing are the years of decline (1991, 1993) due to political situation and the Middle East outbreaks of violence in wider region or at home.

The **Western** Europe dominates the market and OECD countries cover **more than a half** (53%), while the **Arab** countries account for **one third** (32%) of the tourist arrivals in 1995. Most markets are still attracted to places **along the Nile** corridor visiting main cities (predominantly Cairo including El Giza and the pyramids), other historic sites and cultural attractions, or cruising in the Nile.

However, **new segments** of the market (mainly the European) of the "Sun and Beach charter" type are attracted and travel directly to the resorts of the Red Sea and the Gulf of Aqaba coast. This relates to both the state's and industry's efforts to develop new products in these areas and to diversify the Egyptian Tourist Product.

Seasonality problems do not seem to be intensive due to the differences by market segments. E.g. Europeans favour Egypt mainly during the winter while large parts of the Arab market tend to visit Egypt (Cairo and the coastal areas) during the summer.

The study area of Marsa Matrouh – Fuka is still relatively unimportant in comparison with other parts of Egypt, and is characterised by the absolute domination of domestic tourists and Arabs. In 1992, the total number of tourists of the study area was 116,338, of which 79.7% were Egyptian, 16.2% Arab and 4.1% foreign tourists (Table 2).

Table 2: Number of Hotels and Tourists in the Matrouh Governorate During 1992

Item	Tourists			Total
	Egyptian	Arab	Foreign	
Number	92,727	18,839	4,772	116,338

Source: Information and Decision Support Centre, Matrouh Governorate

3.5.4. Advantages and Disadvantages of Tourism Supply and Demand

The tourism development patterns of the Fuka-Matrouh coastal zone show many advantages, but also many disadvantages regarding the possible tourism development. Especially dangerous disadvantage, which is generally not treated enough seriously, is the actual building of so-called tourist resorts in the area, which can have multiplying negative effects on all attractions.

The most important advantages are:

1. The possible use of existing natural features in the area, especially shoreline configuration, topography and good weather.

2. Excellent traffic infrastructure, especially the existence of the Alexandria-Matrouh highway and an airport in Marsa Matrouh.
3. Relatively good general services due to urban development along the seashore, especially in the vicinity of the Marsa Matrouh town.
4. The hospitality of local people and their acceptance of tourist projects in the area disregarding from where the potential tourists will come.
5. Special characteristics of the area, which is different from most of other areas in the Mediterranean (combination of a beautiful seashore + good weather + Sahara nearby + possibilities of visiting various attractions like the Siwa oasis, El Alamein, etc.).

The most important disadvantages are:

1. Lack of infrastructure base in the region for the greater scale tourist projects.
2. Lack of tourism facilities and appropriate services needed in the tourist activities (high quality hotels and restaurants, tourist information services, rent-a-car, etc.).
3. Non-tourist image of the area, especially on the Matrouh-Alexandria motorway (strong military presence, a lot of control check points).
4. Scarcity of human resources that could help in constructing and establishing of tourist projects and to work in tourism in general (lack of tourist tradition).
5. Seasonality of tourism to be developed in the area.
6. The fact that a large part of the coast is occupied with secondary residence villages called "tourist villages", and more and more are already being built.

The last problem seems to be the most significant threatening to endanger the future tourism development of the entire coast, since the size of those establishments is extremely big. Also, the problem is that most of those "tourist villages" are closed for other people, they include the associated coastline closing free access to the beaches and are in most cases crowded, environmental unfriendly and done with dubious solutions regarding architecture. If such construction will continue, the potentials of the area for high standard national and international tourism will be seriously diminished, as well as the possible important source of income for the local people and newcomers.

3.6. Socio-cultural Problems with Special Accent on the Relation Between Tourists and Local Community

Demographic patterns prevailing in the region mean great challenges for the region regarding possible tourism development for two main reasons:

1. A high percentage of illiteracy and a limited educational level, in addition to the strong influence of the customs, means great efforts in education and problems in socio-cultural adaptation to international tourism; and
2. A high percentage of young population which will in a few years reach the working age need a lot of jobs to be created.

Therefore, a great emphasis should be put on improving the quality of life and the productivity of the population, especially in the sections where illiteracy among those who will join the laborforce in a few years time is considerably high.

Nevertheless, a field survey undertaken in the study area intended to get the first hand information on the responses of the residents to possible tourism development in the area has shown very positive reactions to such a development.

The Field Survey

The questionnaire covered all the six main tribes resident in the area, with a total of 101 cases, two of which were females. The age structure of the cases interviewed ranged between 19 and 79 years, with a mean age of 47 years. About 89% of the sample were married, while no cases of divorced or widowed people were found, meaning that the remaining 11% of cases were single. Concerning the prevailing family sizes, it was found, as it would be expected in such areas, that the majority of cases (75%) had families of 6 persons or more. The remaining 25% had families ranging between 2 and 5 members.

The educational structure prevailing among the cases interviewed were found to consist mainly of those who can read and write, and those who obtained primary and secondary education certificates, representing 38%, 23%, and 23% of the cases, respectively. Concerning the illiterate and those who were university graduates, they were found to be minorities, accounting for 8% and 9% of the total cases.

Concerning the employment status of those interviewed, the majority were found to be employed in agricultural and trade activities, representing 39% and 33% of the cases. As for those involved in cheap herding and industries, they were found to be no more than 3% and 1% of the cases. This reflects the great importance of agricultural and trade activities for the residents of the area.

Concerning the locations of the land owned by those interviewed, it was found to be distributed north, south and around the highway, representing 50%, 27% and 23%, respectively.

This diversity of the cases interviewed is intended to get the views of older as well as younger generations, with different educational and employment conditions, towards potential tourist development in the area.

Responses to Possible Tourism Development of the Area

About 75% of the sample accepted the possibilities of working in the tourist activities, while the remaining 25% of the cases rejected this idea. Those rejecting the idea were found to be mainly over 50 years of age. The jobs they were willing to participate in include drivers, local guides, guards, sailors, and services, accounting for 57, 46, 34, 54 and 13%, respectively.

The most attractive tourist activities for the locals were found to be aqueous, trips and hunting, representing 52, 74 and 70% of the cases. As for trading with tourists, the main goods they were willing to trade were food, cheep, and carpets accounting for 88, 86, 24%, respectively. Concerning working in the tourist

establishments, only 7% rejected the idea, while 93% accepted it. The majority of those accepting the idea had no particular preference for the type of work to be involved in. As for the establishment of tourist premises within the local areas of those interviewed, only 13% rejected the idea.

Considering such results in comparison with actual policy of Egypt regarding colonisation of the area from the overpopulated areas in the Delta, it can be concluded that there are no constraints for tourism development. Furthermore, such a development can be described as desirable regarding the constant problem of unemployment in the area and the need for jobs for a predominantly young population.

3.7. Political Economy of Egypt and its Effects on the Study Area

In the following political economy overview of Egypt we selectively examine certain interlinked parameters which are thought to relate and effect significantly the study area's tourism development. These parameters pertain to the country's tourism development situation and the relevant state policies, as well as to the wider development profile focusing on the socio-economic policies and mainly the legislative framework.

3.7.1. The Tourism Policy Profile: the Political/Governmental Decision-making Framework Pertaining to Tourism Planning and Policy Issues

The importance of tourism to the country's national economy has long been recognised by the Egyptian Government which has undertaken various policies for its promotion. The most recent example (1997) is the dominant place tourism assumes within a Long-Term (to year 2017) Economic Development Plan set out in 1997. The promotion of tourism is among the main targets of the Plan, which envisages 27 million tourists and 237 million nights annually by the year 2017. The regional distribution of this future demand and the share of the study area is not envisaged in this **ambitious** or optimistic long - term target.

Regarding tourism's present **economic contribution**, one should mention that the sector is the biggest generator of foreign exchange **after** overseas remittances by Egyptians, the Suez canal tolls, as well as the oil exports. However, one should also note, with regard to the international tourism receipts, the declining yields during the first half of the 1990 decade (receipts per arrival: 1991: $916, and 1995: $575) attributed partly at least to the undercutting of prices by hotels and tour operators for encouraging tourists' inflows.

Apart from the above problem (tourist market downgrading), as well as certain "external" negatively impacting factors (political developments in the wider region, terrorism), one should note the **lack** of good **quality** accommodation and mainly the **lack** of auxiliary/supplementary **services.** Another problems are facilities in the accommodation sector, as well as the limited control in the development of certain accommodation types (holiday villages or tourist settlements).

The privatisation of the tourism industry (mainly the hotel sector) seems to be one of the main features of the government's development strategy, as can be

observed from the growing number of state-owned firms being put on the market. However, the prospects of this strategy's success are difficult to assess, since the dominance of the public sector covers many branches (e.g. banking, telecommunications, etc.) apart from tourism. It seems to be a matter of political and administrative efficiency and will depend on:

a) The extent to which "politically sensitive" economic reforms will be hampered by splits within the ruling political-institutional elite or by public reaction towards particular regulations of foreign policy issues (adoption of accommodation measures with neighbouring countries); and

b) The success of trade liberalisation measures or of specific policy measures undertaken in the areas of marketing (sufficient promotional funding, multimedia campaigns in collaboration with the private sector) and promotion of investments (public and private) – e.g. Law 230/1989, enhancing capital inflows offering attractive investment incentives (e.g. profit repatriation, investment funds re-exportation, tax exemptions, etc.).

Among the various characteristics and constraints of the overall Egyptian Tourism Policy are the scale of tourism development (i.e. large) and the "enclave" (i.e. not integrated) mode of development dominated by foreign demand and commercial tourism. That is against the concentration of restricted domestic tourism to particular zones with tourism development managed by various state institutions and characterised by a limited control and a low quality of accommodation. Such a development has already occupied the most part of the coastal area from Alexandria to El Alamein and is, therefore, threatening to endanger the coastal strip more far to the west, including the study area from Marsa Matrouh to Fuka.

3.7.2. The wider Development Policy Profile of Socio-economic Policies

With regard to the overall economic policy and specifically the economic reforms introduced at the beginning of the 1990's and implemented so far, the following points can be made:

- Diachronically, one may observe a continuous decline in consumer price inflation, liberalised interest and exchange rates, which together with other fiscal and monetary policy measures contributed to lowering the budget deficit from 24.7% of the country's GDP (period 1987/88), to 2.6% (fiscal year 1994/95).
- In the tourism sector **per se**, the above changes are considered beneficial in conjunction with the privatisation policies introduced by the government; also, the outlook for tourism seems good with regard to the economic policy environment.
- More specifically, among the reforms instituted by the government, mainly for maintaining international investor confidence in the economy, the privatisation programme seems to be the key one. The programme covers a wide range of public-sector companies, from utility agencies (e.g. telecommunications) to construction and the provision of public infrastructure works (opening infrastructure to private investments).

In conjunction to the above and in order to support the economic reforms and privatisation in the state monopoly sectors (banking, insurance, telecommunications, etc.), certain legislative reforms are planned by the government for upgrading mainly business legislation.

Within the wider economic environment of international relations, the development of foreign trade is a factor which could benefit tourism. Here, one should briefly mention Egypt's partnership agreement (1997) with the EU in the frame of plans to create a Euro-Med free trade zone by the year 2010, as well as the prospect of creating an Arab free-trade zone (Egypt with 17 Arab States) to cut the tariffs on inter-Arab trade.

4. DATA SYNTHESIS

4.1. Issues of Management and Protection

With regard to environmental protection and spatial planning (urban development, land-uses regulation, etc.) we are selectively outlining certain legislative issues which are thought to relate mostly to the development of tourism and to the CCA of the Fuka-Matrouh area. After a brief reference to international Conventions on Environment and Egypt's deriving obligations, we outline those issues from the country's National Legislation thought to pertain to the study area.

International Context

International Conventions sanctioned by and/or enforceable in Egypt, concerning environmental protection, generally, or in the Mediterranean *per se*.

The obligations relating to the Fuka-Matrouh area development process and sanctioned by or enforceable in Egypt pertain to issues envisaged and agreed in both general and special (Mediterranean) International Conventions. Selectively, we outline certain issues which have the greatest relationship with, or bearing on promoting an environmental friendly and sustainable tourism development:

- Measures and procedures (legislative, technical, administrative) for the conservation of fauna and flora species ensuring also the best methods for their use and development;
- Measures for the prevention of sea water pollution and the protection of the Mediterranean sea and coastal resources (e.g. bathing facilities) from various activities related to land-based sources (discharges from rivers or coastal establishments) or from the sea (damping from ships); and
- Measures for establishing and managing – under the supervision of a Public Authority – integral nature reserves or national parks, forbidding/prohibiting hunting of animals and fishing or any forms of forest exploitation, farming, mining and construction in those areas.

National Context

National Laws and Decrees Pertaining to Spatial Planning and Environment Protection

On the basis of pertinent information[4] we are outlining below certain laws and decrees (issued at various administrative levels: president's, premier's, ministerial, governor's) covering two main areas:

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[4] Mohamed Abdel Aziz El Guindi, Mona Salah El Din Zulficar: A legal Study of Environmental Legislation Relating to the Fuka-Matrouh Area Project.

a) In the area of **spatial/urban planning and land-use regulation** or utilisation, the most relevant and important laws are:

- The Law No. 143/1981 (and decree No. 203/1982) pertains to the definition, organisation and utilisation of desert lands defining conditions, procedures for their administration and development. The Matrouh Governorate is considered a desert Governorate;
- The Law No. 3/1982 (and Decree No. 600/1982) pertains to urban planning, providing the regulatory frame for local authorities, assigning the areas of their competence, setting up guidelines, rules and conditions for land utilisation, buildings/construction regulations and special conditions concerning historic or tourist areas. Two more laws, No. 106/1978 amended by Law No. 30/1983 are also relevant, concerning regulation of building activities; and
- The Law No. 7/1991, partly related to the Law No. 143/1981 above, sets up and stimulates the competence and duties of particular authorities regarding state and land utilisation and management. For example, it stipulates that the General Authority of Tourism Development undertakes the management, exploitation and disposal of lands allocated for tourism development.

b) In the area of **environmental protection**, we may distinguish certain laws and decrees as follows:

- The Law No. 4/1994 is considered the most integral law for the environment for protecting the marine environment, coastal areas and regional waters. In its provisions (certain of which conform to provisions of International Conventions and related agreements/protocols) the law includes the organisational structure of the Environmental Affairs Agency and its specific competencies, as for example: a. establishing branches in Governorates, b. establishing/operating environmental monitoring networks all over the country, and c. drawing regulations (specifications, standards) for carrying out studies on Environmental Impact Assessment (EIA) or for the construction of any establishment in coastal areas (commercial, industrial, tourist, etc.); and
- The Law No. 102/1983 pertains to the natural environment and specifically to the establishment and management of "Natural Reserves". Its provisions and specifications apply to all natural reserves established by specific decrees, e.g. that of the **Al Omayed Reserve** in the Matrouh Governorate.

Concluding the above brief survey of the existing legislation, we should note the difficulty of evaluating its **efficacy** either at the national or regional scale (the Matrouh Governorate). Therefore, an evaluation of the legislation's efficacy is necessary, which is interrelated to political/administrative structural, organisational/functional parameters/factors. In other words, it strongly depends on the planning and the administrative/managerial ability and efficiency (organisation of services, inter-level and inter-sectoral co-ordination, public-private

co-operation, sufficient flows and distribution of financial resources) of those authorities (central or regional) responsible for or charged with the legislation application. Also, a set of parameters constitute an important component for defining and applying specific CCA specifications and guidelines in the area.

However, on the basis of our analysis so far, we may assume that the existing legislative instruments are quite sufficient to support a sustainable tourism development provided they are properly utilised by the relevant authorities, central or regional (the Matrouh Governorate) in conjunction with the relevant planning actions, and provided the adopted ICAM and the related CCA constitute main ingredients of a tourism development plan.

4.2. Tourism Demand and Development – Choices Relative to Domestic, Arab and Western Markets

4.2.1. Main Characteristics of Existing Tourism Demand and Development

With regard to the overall demand figures according to the official statistics one should note that at the beginning of the 1990's the annual tourist arrivals (A) and nights spent (N) have fluctuated considerably:

1990:	148,243 (A)	173,307 (N)	Aver. Stay: 1.17 N per A
1991:	220,665 (A)	338,818 (N)	Aver. Stay: 1.54 N per A
1992:	116,357 (A)	205,916 (N)	Aver. Stay: 1.77 N per A

With regard to the overall market segmentation in the 1990's it should be noticed **first** that it does not seem to change a lot, and **second**, that the domestic market (weekend summer tourism) dominates.

As to the overall distribution of demand, the share of the three main markets ranges percentagewise, as follows:

- Egyptian/domestic market: 75-80%
- Arab market: 14-22%
- International/Western market: 2.5-5%

Considering the existing broad market segmentation and on the basis of the analysis undertaken so far in Section 3.5 concerning Egypt as a whole, one should note that the study area **differs considerably** vis-à-vis other regions of the country with regard to the market segments it attracts. International/western tourism demand is **very limited** in the study area as against other areas of the country, which attract considerable foreign/western market segments either of the "traditional" type (visiting historic/cultural attractions) or of the "sun and beach charter" type, visiting the relatively recently developed coastal resorts in the Red Sea and the Gulf of Aqaba.

According to various reports and the preceding analysis (accommodation capacity) the bulk of present tourism development is concentrated in the Marsa Matrouh urban area, while a limited part is located at the Siwa oasis and at certain isolated

spots. Also, the bulk of present tourism demand (some 90%) concerns summer holidays related to the main domestic market and coastal areas.

4.2.2. Choices Regarding Demand Differentiation

The choices regarding the future demand differentiation or market segmentation, as well as the weight or emphasis each market segment should be given are issues that require particular information inputs mainly with regard to specific socio-cultural parameters.

Specifically, such information would derive from special surveys and analyses of attitudes/opinions/preferences towards tourism – the particular market segments and types of development – covering three main groups: a. residential population, b. tourism business representatives, and c. administrative officials responsible for tourism. Such a survey could extend to cover also tourists in order to understand their preferences and needs and how or to what extent they differentiate.

The resulting information would have been an important input contributing not only to tourism demand or market specification, but also to identifying and establishing:

- Those factors in the community impacted by tourism negatively (cost of land, housing, price of goods and services, etc.) or positively (job opportunities, preservation of cultural and natural attractions etc.);
- The particular socio-cultural problems (relationships between local community and visitors); and
- The guidelines for attaining sustainable tourism development and CCA (social capacity of a destination to absorb tourism).

Following the above observation we are suggesting a very broad segmentation into three main categories according to visitors' ethnic background/nationality and place of origin. One should notice, however, the significance of a detailed segmentation and visitor classification in different groups according to specific variables, such as motivation, consumption preferences, activities pursued, etc., which could provide significant inputs for the design and implementation of an appropriate **marketing strategy**.

Thus, the suggested choice regarding the future tourism market mix is based on the main conclusions and observations deriving from the analysis so far, as well as on certain criteria and variables relevant to the areas of tourism development. Our choice should, therefore, be an intermediate scenario between two alternative scenarios of future tourism demand differentiation, which will be explained in the following chapters:

- A scenario where foreign (mainly western) markets dominate and following, more or less, the type of development taking place in the Red Sea and the Gulf of Aqaba regions (see also option 5.2); and
- A scenario where domestic (mainly) and Arab markets prevail, following the existing development pattern or the continuation of trends (see also option 5.1).

In the suggested choice there is a balanced growth of the three main market segments and avoidance of a complete domination of one over the other. Without specifying precisely each market share, we are suggesting a considerable increase, in the long term, of the International/western markets share (to range between 30 and 35% of the total market) and the Arab market slightly increasing (to 20-25%), both to the debit of the domestic market.

In support of such a choice we are outlining below certain **criteria** related to particular tourism development **variables**:

a) **The seasonality variable**

- The proposed market synthesis may contribute to the best possible annual distribution of demand in a way that peak season pressures are minimised or the surpassing of capacity levels is avoided. This is because western/European markets' preferences favour Egypt during the winter/spring, Arab markets mainly during the summer and domestic in summer, but also in other periods.

b) **The regional/spatial distribution variable**

- The suggested diversification of the tourist market may contribute to a wider geographical coverage, i.e. visitor flows could be more widely spread over the entire region, instead of concentrating only on coastal areas and near the motorway, thus, contributing to a better distribution of benefits derived from tourism.

c) **The Tourist Product diversification and the region's image enhancement variable**

- The proposed market segmentation could support and correspond to a diversified Tourist Product (not an exclusive "sun and beach holidays" product) valorising the region's environmental resources and increasing its attractiveness and competitiveness in the international market.

d) **The long-term stability and demand adjustability variable**

- The suggested diversification of markets could provide better and securing conditions to the industry or the diverse tourist enterprises, from particular demand fluctuations over time.

4.3. Land-use Planning Policy and Development Implications

4.3.1. Existing Situation – General Observations

With regard to existing land-use practices and focusing on the patterns of tourist space production and consumption – in most Mediterranean countries and in Egypt – we may distinguish and outline three main types of tourism's spatial development:

- The **first** assumes, location-wise, a predominantly urban or peri-urban and settlement orientation following the general pattern of a town's growth and

consisting mainly of hotels or guest houses developing and functioning under formal procedures;

- The **second** type, realised to a large extent under conditions of arbitrariness pertains to the production of vacation houses, or the creation of mainly various accommodation types (villas, apartments, tourist settlements or holiday villages) most of which do not seem to operate "officially" as tourism establishments[5]; and
- The **third** type assumes frequently an "international" or "enclave/foreign" character in terms of consumption (utilised predominantly by foreign visitors) and production (standards or inputs utilised). This is a "resort" type which has not as yet developed in the Fuka-Matrouh area.

Focusing on coastal areas we may observe that in all three types and depending on the size or scale of tourism development (infrastructure/superstructure projects, etc.), particular environmental problems arise of varying intensity which demand appropriate planning and management systems. This is also evident in the study area, where the absence of a comprehensive and coherent land-use planning policy and specifically shore-land policy is particularly evidenced in the case of tourism growth[6]. Land utilisation practices and land-use changes seem neither subjected to efficient controls, nor follow guidelines "prescribed" in various plans or development objectives.

4.3.2. Land-use Planning Policy (LUPP) Assessment

The assessment (formulation and implementation) of a LUPP for the Fuka-Matrouh area is a necessity and should be considered as a first priority by the Centre of Land-use Planning and Environmental Management (LUPEM) of Marsa Matrouh. The two interdependent components of such a policy are: a. the design and adoption of a Land-use Plan, and b. the establishment of Land-use Management Guidelines (in connection with appropriate legislative support).

Land-use Management and Land-use Regulation depends largely upon a proper classification/differentiation of the various resources and/or uses into different types; e.g. a land classification that identifies different capabilities for agriculture, forestry, mining, tourism, etc. and places limits upon development.

Focusing on the environmental protection and tourism development of the Fuka-Matrouh area (and on the basis of the conclusions of the preceding analysis) an integral LUPP should encompass two interdependent land-use plans: a. a General Land-use Plan, and b. a Tourism-Specific Land-use Plan:

- The **General Land-use Plan** should embody the entire set of zones and zonal divisions corresponding to the different production sectors, as well as the zones of ekistic (built-up) areas and development or land zones within

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[5] Characteristic example is the type of development along the narrow coastal zone from Alexandria to El-Alamein.

[6] Characteristic paradigm is the development of "tourist villages".

approved town/settlement plans. The plan should also indicate the main transport networks, as well as specific land uses (coastal protection zones, nature reserves, etc.), setting zonal regulations (land-use restrictions and building regulation measures) and possibly outlining financial and fiscal incentives; and

- The **Tourism-Specific Land-use Plan** should embody environmental protection and tourism development zones of specific types[7] which are assessed and differentiated according to: a. the intensity/size/spatial distribution of various recreation activities and user/visitor services (accommodation, restaurants, shops, etc.), b. the resources capacity or fragility, and c. the kind (coverage/diversity) of management resources needed.

The various information/data inputs needed for an integral assessment of the Land-use Plan at the regional scale (Governorate), according to the two types outlined above, are presented in the following Diagram 2.

Apart from the overall (regional) approach of assessing and implementing the LUPP, the importance, particularly for tourism of the **Site Scale** design of land-use and management plans should not be ignored.

Environmental design and land - use plans at this scale together with management guidelines should be prepared for those zones which have been identified in the Land-use Plan as having the greatest potential for development (e.g. tourism potential destination zones), or priority for protection control and management. As to the latter, one should consider specific activities (e.g. developing pilot areas for protection, controlled grazing, and a co-operative system for grazing management) suggested elsewhere.

All development agents, public or private, and particularly investors and developers of tourist projects need to know both the overall context of their projects and mainly the specific conditions of the area in which the project is located.

4.3.3. Development Implications of the LUPP

The implications from the implementation of the LUPP in the Fuka-Matrouh area can only be outlined in broad terms as follows:

- It contributes in:
  - i) attaining the widest range of beneficial uses of the environment without degradation risks (health, safety); and
  - ii) preserving important historic/cultural and natural aspects of the area's heritage.

[7] For example, the "resort" type of tourism development should come under particular land-use regulations through specific legislative acts, and setting conditions/requirements (by the relevant authorities) for enhancing controls.

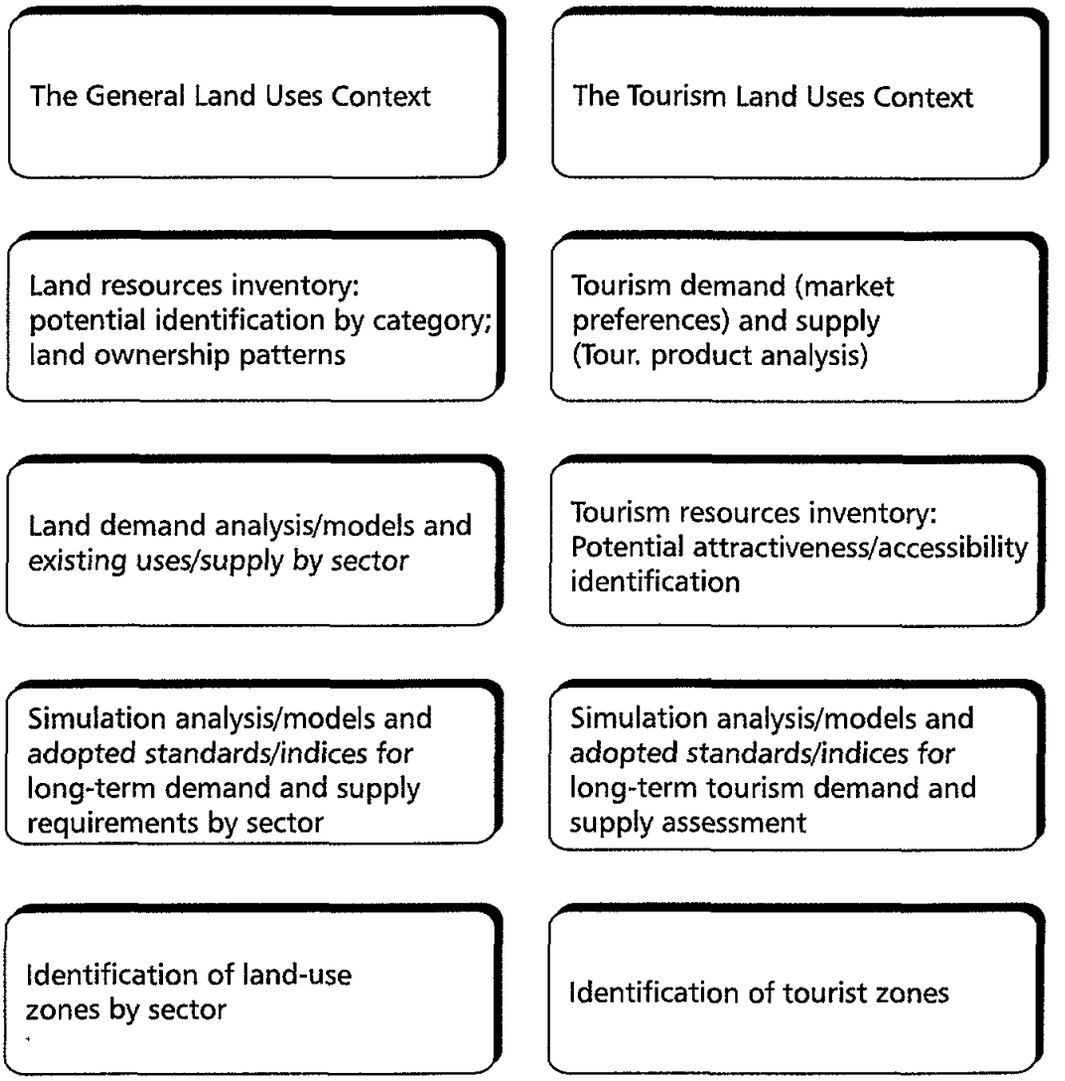


Diagram 2: Main Inputs to Land-use Assessment Process for the Fuka-Matrouh Area

The protection, enhancement and promotion of the area's "individuality" or authenticity provides the greatest opportunity for sustainable tourism development as follows.

- Support a viable economy characterised by stability, diversity and growth that enables the fulfilment of social needs by achieving the rational use of resources and a balance between population and resource use in a way which permits satisfactory standards of living; and
- Provide the background (guidance and requirements) for designing and implementing specific projects (in tourism per se, or in other sectors), as well as, suggesting specific needs or areas of action that should be undertaken by the relevant central or regional (Governorate) authorities.

4.4. Synthesis of the New Situation, and Possible Alternative Approaches to Tourism Development in the Matrouh-Fuka Coastal Zone

The overall analysis of the situation in the area has shown a few key points that have to be considered before the final assessment of different scenarios. Those key points can be summarised according to the previous data analysis and synthesis as follows:

- The Matrouh-Fuka coastal zone can be positioned in the closer and wider surroundings as a new and specific tourist destination.
- The key advantages of the area regarding the Mediterranean in general are its specific characteristics due to its location, unique tourist profile market with the combination of seaside/beach type of destination with few, but specific attractions. They include white sand beaches with clear light blue sea, antique monuments with an accent on personalities like Cleopatra and Alexander the Great, important monuments from the Second World War (El Alamein memorial graveyards, Rommel museum), unique desert attractions (Siwa oasis), and the possibility to visit relatively easily other attractions of Egypt
- The key disadvantages of the area, from a strictly tourist point of view, are result of its position in Egypt as an area oriented predominantly to domestic/Arab market with huge number of capacities built predominantly for the need of Egyptian working population. It is also an area which is not very much turistified in general, despite relatively good infrastructure conditions (motorway, airport, existence of the relatively big town of Marsa Matrouh).
- Although the area is in a way sensitive regarding its physical characteristics, it has already been seriously attacked by new construction of two predominant types:

  a) new housing and some industry due to its position as immigration territory dedicated to solve the problem of the overpopulation of the Nile Delta area

  b) so-called "tourist resorts", but practically secondary homes resorts with a prospective to fulfil the needs of the whole sixty million population of Egypt. That role is given to the whole Egyptian Mediterranean coast, but the study area represents one of the most attractive parts of it.

  If we consider that modern tourism understands that any new establishment needs to be located in basically environmentally friendly surroundings, and that some buffer zones without any construction are needed in order to be competitive on the market, even the large scale commercial establishments are in such conditions environmentally more friendly than the existing ones. Therefore, a change of general orientation from housing, industry and secondary residences towards commercial capacities cannot be seen as a threat, but rather as an effective tool towards the protection of the environment.

- The analysis has shown certain problems regarding water supply, as well as some other infrastructure (sewage, solid waste disposal, telecommunications, etc.). Considering the before mentioned prospects of development, it is obvious that orientation towards commercial tourism instead of the basically non-commercial secondary residences will:

  1. reduce the need for fresh water supply due to smaller number of users, or at least keep it at a similar level[8]
  2. provide additional funds for financing infrastructure investments through revenues from hotel business instead of burdening the already weak governmental budget, and
  3. stimulate better quality and environmental concern regarding infrastructure in general, in order to satisfy the needs of predominantly European users of commercial establishments (especially regarding liquid and solid wastes treatment, and telecommunications)

- The general picture of the area regarding demographic and economic issues suggests that the population is growing fast, and that it is very young and not educated. It is also evident that the newcoming population from the Delta has a tendency to become a majority in the coming years.
- The economic situation in the area is marked by a shortage of industry, and a prevalence of seasonal tourism in the tertiary sector. High percentage of young population which will in few years reach the working age means that a lot of jobs have to be created in the area in near future.
- Under such circumstances the existing tourism orientation on predominantly domestic market in basically non-commercial capacities means a limitation of possible job creation in the near future. To the contrary, commercial establishments based on foreign/European tourist demand can create a lot of new all-year jobs, because Europeans generally tend to avoid summer season due to extremely hot weather in the area.
- The socio-cultural problems, i.e. the relation between tourists and the local community, cannot be seen as a limiting factor for any kind of tourism development in the area for two key reasons:

  a) The actual policy of the state of Egypt regarding colonisation of the area from the overpopulated areas in the Nile Delta results in the prevalence of immigrant population in general. Therefore, even if some threat of destruction of the local/tribal culture and their general values exists, it is not possible to avoid it. Considering the possible future development, there is no doubt that, due to a high volume of permanent and

[8] It must be understood that commercial tourist capacities need much more water per person than non-commercial ones, especially those of lower quality; at the same time higher quality of tourist accommodation usually occupies much larger territory per person, which balances the needs regarding space and water supply.

temporary immigration[9], this area cannot be much different from the social-cultural point of view of the rest of Egypt, especially in urban areas, i.e. in the Marsa Matrouh town.

b) Since about 75 percent of the sample in a field survey have accepted the possibilities of working in the tourism activities, and have no reservations regarding European tourists, there are no reasons to worry about possible negative effects of commercial tourism in the area. Since those rejecting the idea of working in tourism are mainly those over 50 years of age, it can be concluded that the absolute majority of local population see tourism development not only as a desirable economic activity for the area, but also for them personally.

- The political economy of Egypt sees tourism as one of the most important economic activities of the country, and has already established legal and fiscal mechanisms to support it. Therefore, the main problem of the Matrouh-Fuka area is a need of the State to fulfil at the same time the domestic people's right to use tourism resources for themselves.
- That need has resulted in a concentration of restricted domestic tourism to particular zones with tourist development managed by various state institutions, and characterised by limited control and low quality of accommodation. Unfortunately for the area in concern, it seems to be that the Mediterranean coast in general has been intended for this function, with the study area functioning as a very desirable one due to the position of the Marsa Matrouh town as the only larger urban area between Alexandria and the Libyan border.
- Issues of management and protection show that in Egypt exists a certain group of legislative instruments which are quite sufficient to support a sustainable tourism development, but the problem lies in their efficacy at both national and regional scales.
- In that sense the introduction of tourism capacities which can be competitive on the international market can support the implementation of those instruments, because the international subjects in charge of investments will insist on their application. For them it is necessary not because of their wish to improve the quality of the environment, but in order to secure efficacy of their establishments as required by ecological sensitivity of the users coming from the ecologically conscious European market.
- The existing tourism development patterns of the Matrouh-Fuka coastal zone marked by secondary residence resorts for Egyptian people tend to produce tourist saturation of the area in a relatively short period. The threat will become even bigger if those resorts are primarily oriented towards a lower

[9] The users of actual tourist resorts can be considered as temporary population of the area, who, during their period of stay in summer, also have an effect on the local population, if not like permanent inhabitants, than definitely not less than foreign tourists.

level of quality, because it generally means higher concentration of people in small area and higher occupation of the beaches.

- A better quality level of tourist establishments generally means not only lower concentration of people, but also diminishes pressure on the coast owing to a higher mobility of users, who are more able to spend additional funds for visiting other places outside their accommodation, and have more interest in cultural attractions, excursions, etc.
- In other words, a change of tourism development patterns towards the European market, and higher quality commercial accommodation can encourage dispersion of tourism throughout the area, and reduce pressures on the beach areas.
- Finally, it is concluded that an integrated Land-use Planning Policy, consisting of two interdependent land-use plans (general and for tourism) can be used as an efficient tool for the implementation of sustainable overall and tourism development of the area.

From the above key points of the synthesis of the new situation it can be concluded that the sustainable tourism scenario is probably somewhere between the two extremes below:

1. Undesirable, but unfortunately realistic scenario of tourism development without any restrictions, which, under the existing circumstances, would be a continuation of the existing environmentally and economically extremely unfriendly trend of interpolation of secondary residence resorts in all suitable areas; and
2. Maybe desirable from a purely environmental point of view, but in reality not realistic alternative scenario which, under the existing circumstances would be a strict restriction of any kind of tourism development

Therefore, the only realistic and, at the same time, sustainable scenarios under the actual circumstances are those in which the European market should play a more important role in the future tourism development, which can be realised either through:

1. A scenario of free transfer to commercial interests for overall development predominantly by foreign entrepreneurs; or
2. A sustainable scenario which tends to achieve this goal with the use of controlling instruments which can enable the fulfillment of both the needs of the people in the area, and the state of Egypt in general.

5. TOURISM DEVELOPMENT OPTIONS

5.1. Tourism Development Without Restrictions and Control Based on Domestic Large and Small Scale Investments

The option of tourism development without restrictions and control in actual circumstances is the continuation of the existing trends of enormous growth of so-called tourist resorts, but practically secondary residence resorts built for the people of Egypt. Such trend can be viewed as the most extreme one, because the majority of those "tourist resorts" are built for the demand with a very low purchasing power, with a consequence of the much higher density of people per sq. m of land area and per meter of the beach than in case of commercial tourism capacities.

The number of beds in so called "tourist resorts" is estimated between 30,000 and 40,000 or more, because any precise approximation was not possible due to the fact that almost all such establishments are closed for non users and the owners were not willing to give the right numbers. Considering that on more than 40 new locations (according to the unofficial information) the licences for building are already issued, it can be estimated that the total number of people in those objects will surely reach the minimum of 100,000, if not much more, if we count also the existing commercial capacities.

Although it seems that at the time no more licences for building of those capacities will be issued, considering the actual situation on the entire Mediterranean coast of Egypt, especially close to Alexandria, it can happen that the trend will continue also in the future despite the temporary standstill. The continuation of those trends, even on a small scale, can very easily result in more than 150,000 or 200,000 persons from attacking the coastline of the Marsa Matrouh-Fuka coastal zone, what is above the pure physical carrying capacity of the area according to the basic calculations in relation to the length of beach and possible number of users.

Such a development can in practice cover almost the entire study area with accommodation capacities, leaving free only those not easily accessible ones, and those which due to their ecological importance eventually can get a sort of protected area status, such as part of Ras El Hekma peninsula (see Figure 7). Even those few commercial capacities can in such circumstances attract primarily domestic market and, therefore, result in a poor outcome regarding income and employment.

Since it has already been stated that the demographic and socio-cultural parameters are not a limiting factor of carrying capacity due to strong urbanisation and immigrant character of the area, it has to be mentioned that such a development is extremely dangerous for the area not so much from the physical-ecological, as from the economical and political point of view. The key reasons for such a conclusion are consequences, such as:

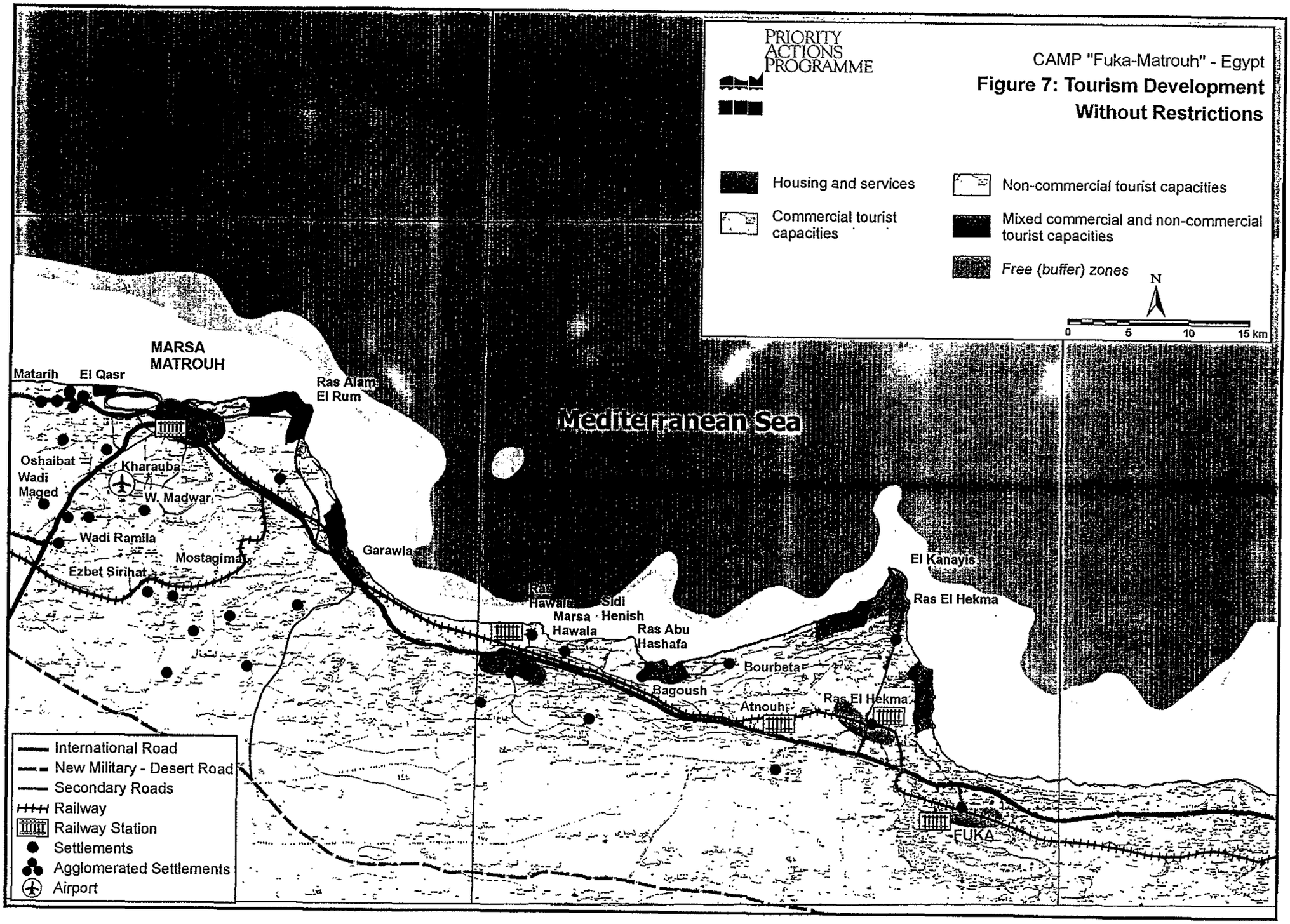
1. The building of secondary residences attacks usually the most attractive part of the study area, either from the natural (close to the attractive beaches) or infrastructural point of view (close to the Marsa Matrouh town and coastal motorway);
2. The "tourist resorts" in most cases include a stretch of coastline surrounded with a fence, so there is no free access to coast for other users, what limits the access to the coastal zone in general; that limits also a possibility to form a riviera type of destination, what is considered as a typology of the study area;
3. As a consequence of the above, there will only be a few attractive spots for possible commercial tourism development, with relatively unfavourable conditions regarding natural attractiveness and burdened with higher investment costs due to additional investments in the basic infrastructure (roads, water pipeline, electricity, etc.); and
4. Finally, a huge scale of such development will discourage eventual investors in commercial capacities due to a poor image of the area caused by high concentration of tourists with a very low purchasing power (especially if those commercial capacities tend to attract foreign tourist demand).

All above mentioned consequences will result in a fact that the most favourable resources for the future economic development will be lost forever, especially if we consider that there are no other such favourable sources of income in the Fuka-Matrouh area. Namely, the study area includes the town of Marsa Matrouh, as the only important urban settlement on the entire coast between Alexandria and the Libyan border and, therefore, the area which has the highest interest in finding new jobs.

In such circumstances, the logical proposal should be a strict rejection of option of continuation of the existing trends and usage of all possible measures to stop the continuation of issuing new licences for new secondary residence capacities. Since the need for those capacities cannot be rejected in general, because the people of Egypt must have a right to spend a holiday in a form of accommodation they are able to afford (and this form is evidently the one), the development of those tourist resorts should take place in some areas where negative effects as above mentioned can be avoided.

Since the majority of Egyptian people do not use air traffic for holiday purposes due to their low purchase power, for them is not necessary to be oriented on the area close to the Marsa Matrouh town, as with foreign tourists oriented almost exclusively on air traffic. Therefore, the areas closer to Alexandria are more suitable for Egyptians, and the study area for foreign tourists. At the same time, allocation of secondary residence resorts closer to Alexandria is more appropriate both for ecological and economic reasons because:

a) this area, especially close to Alexandria, is already devastated with construction of secondary residence resorts and other construction (what is not a problem for domestic people used to live in overpopulated areas, but is for foreign tourists); and


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Figure 7: Tourism Development Without Restrictions
Housing and services
Commercial tourist capacities
Non-commercial tourist capacities
Mixed commercial and non-commercial tourist capacities
Free (buffer) zones
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
Oshaibat
Wadi Maged
Kharauba
W. Madwar
Wadi Ramila
Mostagima
Ezbet Sirihat
Garawla
Ra's Hawala
Sidi Marsa - Henish
Hawala
Ras Abu Hashafa
El Kanayis
Ras El Hekma
Bourbeta
Bagoush
Atnouh
Ras El Hekma
FUKA
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport

b) it cannot produce huge economical problems, because the allocation is oriented either on urbanised and industrialised area (closer to Alexandria) or sparsely populated area (more far from Alexandria).

Therefore, it is suggested to limit the new construction of secondary residence resorts from Alexandria to about 70 kilometres east from Marsa Matrouh, what is approximately the limit of the study area. In that case, both basic social and economic needs can be fulfilled – the right of the Egyptian people to spend a holiday in their own houses will be enabled and the key economic resource basis of the Matrouh Governorate will be protected for the future generations.

5.2. The Option of Free Transfer to Commercial Interests for Overall Development Predominantly by Foreign Entrepreneurs

From both a conceptual and an operational point of view this option relates to a specific structure of the tourist industry, as well as of the tourist product and market (a defined group of consumers geared towards a particular product or range of products).

- A **tourist industry,** with the predominance of foreign enterprises/businesses related mainly to package holiday travel.
- A **tourist product,** which is tailored to the particular needs of the market, or the clientele favoured by the tourist entrepreneurs.
- A **tourist market,** which consists of foreign, predominantly European tourists or market segments.

5.2.1. The Tourist Businesses/Entrepreneurial Environment

With the basic premise that this option ("free transfer to commercial interests") involves the withdrawal to a large extent or confinement of public/government involvement in tourism, it is logical to assume that the underlying to this development mode **principles** and **goals** relate and adjust more or less to the business' operational environment.

The predominance of **foreign enterprises** relates to two basic operational components:

a) such businesses have within their power the ability to change certain aspects of their internal operations as and when they consider it fit; and

b) the environment within which such business operates pertains to the country's and region's specific political, economic, legal and socio-cultural structures. An overall environmental structure which is subjected to changes over time (necessitating corresponding adaptations by business) and which business can variably influence or over which they have a considerable or limited control.

5.2.2. The Tourist Product and Market Formation

Foreign businesses (entrepreneurs, investors, etc.) having a clear understanding of

a) which products are in demand; and

b) how (the different ways) to maximise their profits

will direct their attention and efforts towards tailoring the study area's tourist products closely to the needs of their clients.

This could happen if there is a little relation with their immediate economic and socio-cultural surroundings, or if there is no co-operation and working in harmony with local/host communities, which could result in a development irrespectively of the pragmatic local community needs or the capacity of the region's resources.

Among the major trends in the tourism industry, one should mention the tough competition and pressure to cut costs which lead businesses to consolidation and mergers, as well as, to a large scale tourism development, and the "inevitability" of which is argued with regard to external economies of scale and the market structure of international tourism. Another recent trend pertains to efforts geared towards diversifying the predominant development type of the traditional "mass package beach vacations", a rather favourable trend for a region's development.

However, on the basis of a wider consensus pertaining to this mode of development by foreign enterprises (the option discussed) one may observe the following:

- This development mode leads to the formation of a Tourist Product which follows modern development standards (facilities, services, etc.). but is characterised by isolation (spatially and socially) and is frequently called "tourist enclave resort" type of development. According to certain analysts' views[10] "enclave resorts" result in minimal economic benefits for the host community, due to their high leakage rate, their dependency on international charter operations, the use of high imports (consumption products) and expatriate employees.

Following the above description of the option's main components, one should note the following:

- The development potential or realisation prospects of this option should be viewed mainly within the frame of the state's (governmental) future tourism, as well as the overall development policy.

The future tourism policy may be seen as falling in and relating to the three scenarios outlined below and pertaining to the evolution/change and the future overall profile of governmental development policy:

a) The status quo, or the traditional approach scenario according to which the central government maintains its dominant role following the existing development policies and practices;

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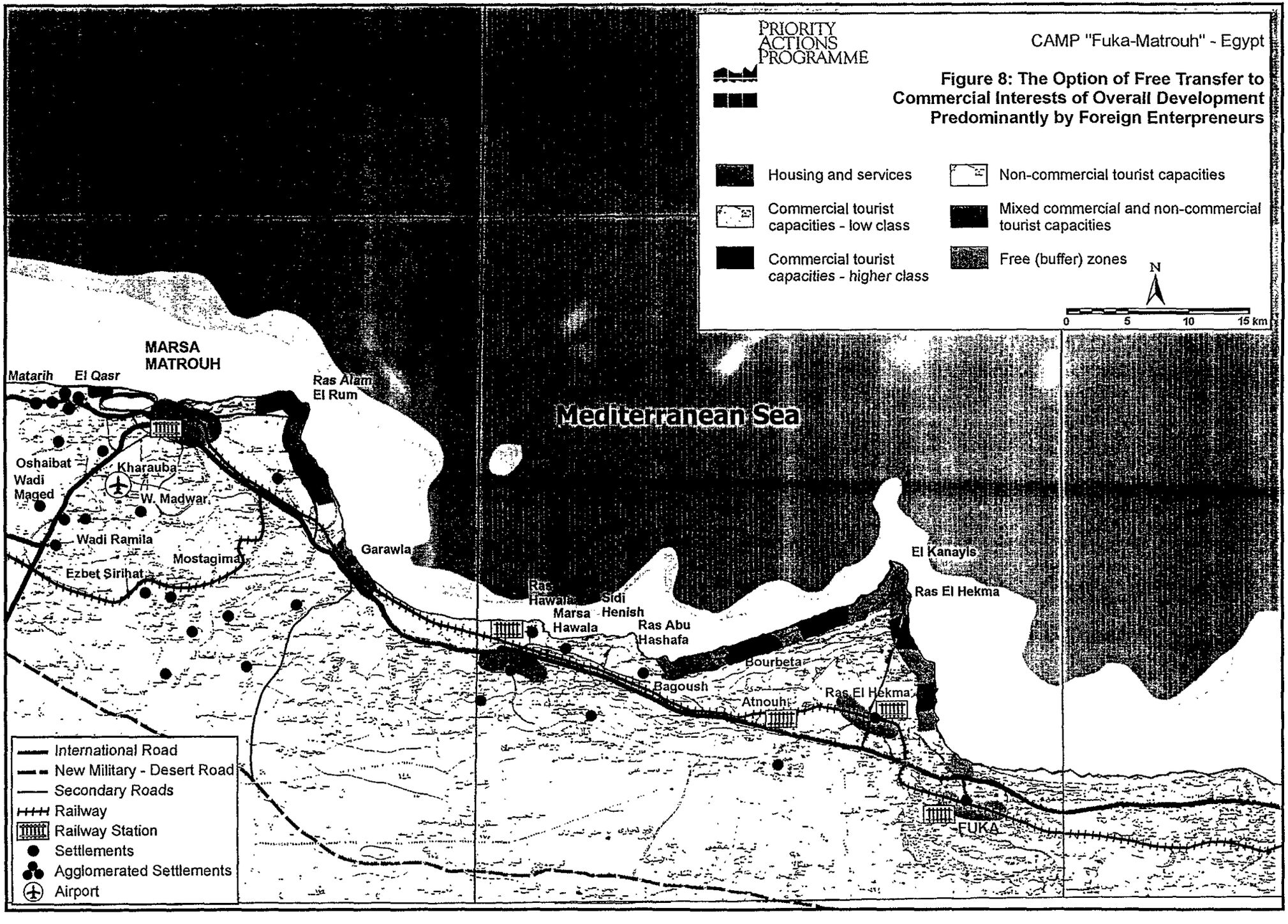
[10] Wilkinson P. (1985) "Strategies for tourism in island Microstates" Annals of Tourism Research, Vol. 16, No. 2.


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Figure 8: The Option of Free Transfer to Commercial Interests of Overall Development Predominantly by Foreign Enterpreneurs
Housing and services
Commercial tourist capacities - low class
Commercial tourist capacities - higher class
Non-commercial tourist capacities
Mixed commercial and non-commercial tourist capacities
Free (buffer) zones
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
Oshaibat
Wadi Maged
Kharauba
W. Madwar
Wadi Ramila
Mostagimat
Ezbet Sirihat
Garawla
Ras Hawala
Marsa Hawala
Sidi Henish
Ras Abu Hashafa
El Kanayis
Ras El Hekma
Bourbeta
Bagoush
Atnouh
Ras El Hekma
FUKA
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport

b) The radical change scenario, where the role of the central government is limited and the private sector's involvement is dominant at the planning and policy formulation levels; and

c) An intermediate (as to the above two) scenario between a centralised planning and operational system and a complete privatisation with no change of status quo but with technical/administrative efficiency and effective management/co-ordination of development policies.

Evidently, this option falls into the second scenario and relates to a mode of tourism's growth which seems to develop independently or to have limited integration (inter-sectoral or otherwise) and interlinkages with the region's overall development process, or with the objectives of the ICAM plan.

The approximate spatial development of this option will probably tend to occupy primarily the area around the Ras El Hekma peninsula, because it allows to form "tourist enclave resort" type of development, i.e. separation from the existing secondary residence capacities and the local population in general. It is also likely that some entrepreneurs will have interest to be closer to Marsa Matrouh in order to be close as possible to the airport and to the city itself (see Figure 8).

Since this option is by the definition the one which does not take much care about the carrying capacity issues, there is no sense to calculate the number of beds, especially because it will be very much dependent on the typology of the market.[11] Anyway, this number cannot be larger than in the previous option of the continuation of the existing trends.

5.3. Alternative Tourism Option

An alternative tourism scenario based on a strict nature protection and predominantly on "eco" types of tourism is in the Fuka-Matrouh area not a possible one, since the area is already occupied with a lot of big scale tourism accommodation capacities and exposed to strong immigration. Considering the actual growth of various buildings, infrastructure, industry, etc., an alternative scenario for the area can be explained only in a form of strict restriction of any kind of new tourism development. According to the actual situation, the attempts to limit the tourism development in order to preserve either natural or cultural environment have no real chances to be realised.

In the line of alternative option are some studies which see the future of the study area mainly as an agricultural with tourism as an additional activity. One of the most recent and comprehensive studies the study arguing the opportunities for the development of the North West Coast was conducted in 1995 by Prof. M.A. Ayyad for UNEP. The study aimed at listing the characteristics of the region and it was concluded with certain guidelines or remarks that should be taken into consideration when planning for the development of the region. These remarks can be summarised as follows:

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[11] Higher category of the establishments usually means lower number of beds per square meter of project development area and vice versa.

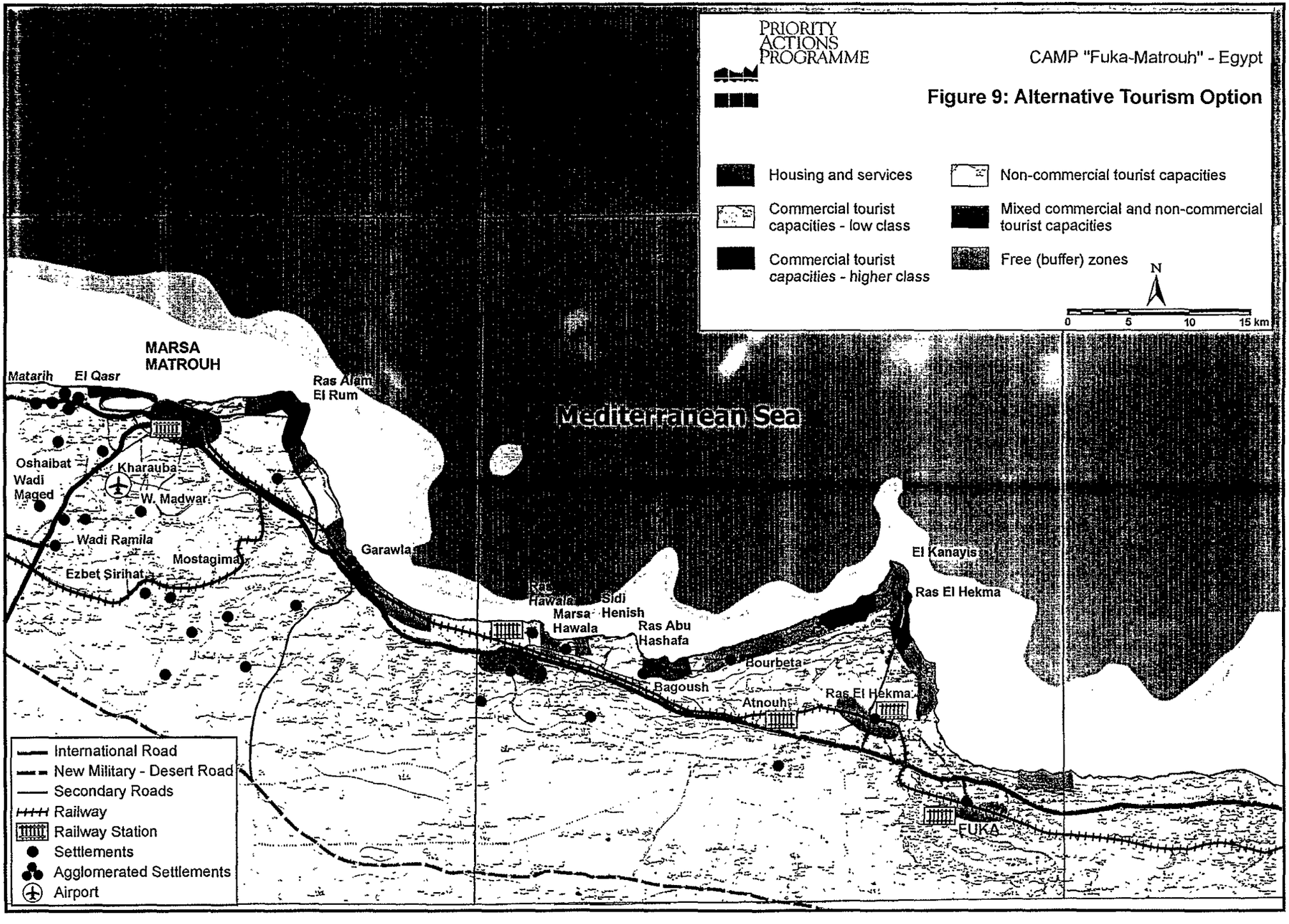
1. There is a need for setting up a clear policy for land tenureship.
2. The agricultural projects are of prime importance to the population of the region.
3. Concerning the industrial activities, focusing should be on the manufacture of food, in addition to handicrafts expressing the existing environment.
4. Industrialisation of agricultural and animal products carried out by local population should be considered as an important sector of development.
5. The agricultural and grazing activities are the economic basis of development, therefore, they should take precedence in the region.
6. The projects of agricultural, grazing and handicrafts should integrate with the tourist activities, which are capital intensive, in the form of a cluster of tourist villages that will have agricultural surrounding, necessary for providing tourists with food and traditional souvenirs.
7. The development process will never achieve its target without the conscious, active participation of the local citizens, and their full approval of the intent of the authorities undertaking the development and reconstruction programmes.
8. The role of women must be carefully considered in the development programmes.

Although the general idea of the study was in the line of local people needs, it has neglected the actual key problem of huge scale holiday home resorts in a way that they were not seen as a main threat to the local economy. Namely, the predominately domestic tourist demand in those resorts is potentially much bigger than foreign tourist demand, but is at the same time much less interested in local products than foreigners and, therefore, much less desirable from both the economical and ecological aspect.

Furthermore, the limitation of commercial tourism development can be contraproductive from the ecological point of view, because the need to solve the unemployment problem in the area and especially the Marsa Matrouh town will in case of restrictions towards tourism probably result in the introduction of industrial capacities and/or in housing close to the coastline.

Therefore, the possible spatial result of such an option shows much lower concentration of accommodation capacities (see Figure 9), but regarding actual situation can result in other types of construction in the coastal zone that are not shown, but can be even more dangerous. We must also take into account that due to the absence of commercial tourism the local community will be less sensitive towards the protection in general (as seen in the coastal strip close to Alexandria), especially because the area cannot be easily controlled due to the low population density.

In such circumstances, the commercial tourism development cannot be seen as a threat, but more likely as a most efficient tool towards protection of the environment. That role is a result of a direct economical interest of modern tourism development to:


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Figure 9: Alternative Tourism Option
Housing and services
Commercial tourist capacities - low class
Commercial tourist capacities - higher class
Non-commercial tourist capacities
Mixed commercial and non-commercial tourist capacities
Free (buffer) zones
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
Oshaibat
Wadi Maged
Kharauba
W. Madwar
Wadi Ramila
Mostagima
Ezbet Sirihat
Garawla
Ras Hawala
Marsa Hawala
Sidi Henish
Ras Abu Hashafa
El Kanayis
Ras El Hekma
Bourbeta
Bagoush
Atnouh
Ras El Hekma
FUKA
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport

- keep a narrow coastal zone as much as possible in natural condition, especially the most attractive beach areas;
- keep some parts of the wider coastal zone and adjacent areas completely intact due to a necessity to produce some buffer zones between the accommodation establishment; that is necessary in order to increase their market value, because accommodation establishments surrounded by natural areas usually have higher economical value than those in urbanised and especially saturated areas; and
- to discourage environmental very unfriendly further construction of secondary residence resorts, as their possible competitor reflecting to the most attractive parts of the coastal zone and a factor of decreasing their market value due to saturation processes.

Therefore, the sustainable tourism development option based on introduction of commercial tourism capacities and foreign tourist demand in the Fuka-Matrouh area is in practice more environmental friendly than the alternative tourism option based on restriction of further investments. What is even more important, the following sustainable option offers also an effective tool for the solution of the unemployment problem and, therefore, makes a bright prospect for the overall development of the whole study area and the Matrouh Governorate, in general.

5.4. Sustainable Tourism Development Option

Although there are some differences regarding the concepts, principles and operational aspects of sustainable development there seems to exist a general consensus[12] regarding the main goals of this development modality and process:

- A development modality that considers carefully a country's or a region's need to use properly its natural resources for promoting a viable economic growth and socio-economic development; and
- A process that involves managerial regulatory interventions to limit negative impacts of human activities on the environment and secure that damages incurred for the general good are not irreversible.

The fundamental (basic) premise underlying the STD option outlined below is based on the assumption that there exists an alternative mode of tourism development, different from the predominant today which is deleterious to the environment. A development mode through which tourism as an essential component of economic development contributes to continuous economic growth without environmental deterioration or destruction. On this basis we analyse below the two constituent parts of the STD option:

a) The main assumptions as to the principles and goals underlying an STD option and on that basis the suggested synthesis of the Tourist Product; and

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[12] There is also a degree of consensus on the viability and the good prospect of achieving a STD without negative impacts / damages to the travel industry / tourism businesses. See e.g. Filho W.L."Putting principles into practices: sustainable tourism in small island states". International Conference on Sustainable Tourism. Malta, 1993.

b) A general and preliminary delineation of the main parameters defining Carrying Capacity relevant to the STD option.

Principles/Goals of STD and the Synthesis of the Tourist Product

Among the principles and goals of sustainable tourism development we may selectively distinguish and outline here the following most relevant ones to the study area:

- Select and promote tourist products and specific development objectives which conduce to the intraregional differentiation and diversity of the tourist product;
- Maximise the economic benefits of tourism over the entire region by providing the best interlinkages of coastal tourism to the hinterland areas and other sectors of the regional economy;
- Encourage and support local initiatives and involvement conditions in tourism development, as well as the maximisation of the spread range of socio-economic and environmental benefits occurring to the local communities;
- Secure and promote a symbiotic relationship between economic and ecological development parameters: conserving and enhancing the entire range of environmental (physical and socio-cultural) assets of varied coastal and inland landscapes; and
- Secure and promote continuity and adjustability of the coastal tourism development within its wider environment concerning types or models of tourism development capable of responding to conditions of the international tourist market, and maintaining a continuous attractiveness within the destination choice patterns of different visitor groups.

The suggested overall synthesis/structure of the tourist product is based on the preceding identification of existing development patterns and on the area's tourist capability, i.e. a general evaluation of existing resources (natural, human, socio-economic) and their potential. The envisaged long-term structure of the area's tourist product, outlined in Table 3, consists of three main Product Lines and related production phases (various inputs and outputs) which contribute to the development of an integrated tourist product corresponding to a diversified tourist market.

The proposed structural diversity of the tourist product corresponds to a supply which differs from the existing dominant development patterns (e.g. tourist villages / summer residences) for the prevailing of domestic tourists, or from the "enclave tourism" types of development (evidenced in certain coastal regions but not as yet in the study area) according to which there is a distinct separation of foreign tourism (mainly in isolated resorts) from domestic tourism and generally the local milieu.

Primary Inputs (Resources)	Intermediary Inputs (Infrastructure)	Intermediary Outputs (Supporting Services)	Final Outputs (Activities-Experiences)
Attraction resources: natural, cultural	**Product Line I: Elements of Superstructure (accommodation) and Infrastructure**		
	1. Main accommodation types: Traditional units (hotels and similar establishments), mainly of urban orientation, campsites and tourist villages, holidays dwellings/second homes	7. Diverse services: related to the various accommodation types and/or the supporting tourist infrastructure	11. Recreation: renewal, entertainment, relaxation
			12. Experiencing local milieu: socio-cultural interaction, contacts, local cuisine
Financial/capital resources	2. Supporting tourist infrastructure: Catering, shopping, entertainment, athletic/sport facilities		
Public infrastructure: energy networks, transport, communication	**Product Line II: Elements of Environmental Attractions** (over the entire region: SWE of Matrouh)		
	3. Cultural: heritage/ archaeological sites, temples, museums, living heritage attractions (traditional/local cultures)	8. Special Services: related to cultural attractions (e.g. museum guides), or natural (e.g. medical, therapeutic in spas)	13. Cultural and outdoor recreation: athletic activities and experiences of professional, scientific, recreational, educational and religious nature
Sociocultural infrastructure, human resources	4. Natural, Ecological: beaches, ecosystems, nature reserves, spas/thermal springs (Siwa)	9. Basic services: for technical/ /scientific support, protection and management of attractions	
Land and building materials, construction technology	**Product Line III: Elements of Transport/Touring networks and Tourism Information**		
	5. Travel networks and itineraries: the entire fabric of interconnected travel centres (terminals, centres) itineraries, circuits and means of travel, touring.	10. Services pertaining to travel agencies: coach operators, car rentals, travel guides, animators and information centres.	14. Touring activities and experiences: related to sightseeing, photography, safari expeditions, etc.
Production: Primary, secondary, tertiary sector	6. Information and advertisement networks: information/ communication offices linked to travel agencies/ hotel establishments, or independent		

Table 3: Structure of the Tourist Product: Main Product Lines and Production Phases

The proposed three product lines are strongly interrelated and their development depends on both the primary inputs/resources needed and the correct timing and co-ordination of various policy measures in tourism per se or in other sectors. However, the sustainability of the proposed tourist product is dependent on the parallel development of an appropriate and corresponding to the tourist product tourist market.

An appropriate tourism market structure or segmentation from a planning/policy formulation point of view follows and adjusts progressively to the process of the Tourist Product formation on the basis of a specific strategy of Tourism Market

Segmentation. This is a long-term process which considers and interrelates different market segments across specific issues:

- across time: with regard to the varying periods / dates of arrivals and length of stay;
- across space: considering the various spatial distribution patterns (coastal, hinterland areas, etc.) and movement of tourists;
- across origin places: analysing the specific origin places of the broad Western/Arab/Egyptian clientele mix; and
- across activities: exploring the orientation of each market segment to specific activities and promoting an appropriate activities pattern.

The last issue is of particular significance because it involves tourism's interlinkages with other local activities and production sectors. For example, tourist activities related to traditional arts and crafts will both preserve local cultures and contribute to the viability of this local economic activity. Also, environment related tourist activities will contribute to supporting local economies (employment) and maintaining natural resources.

Carrying Capacity for the STD Option

With regard to a preliminary and general delineation of carrying capacity related to the STD option, we are briefly outlining below the three main categories of parameters (see Diagram 3) which roughly indicate the main quantitative and quality capacity levels of the area: a. the physical – ecological parameters, b. the socio-cultural parameters, and c. the political – economic parameters.

With regard to the first category, and specifically the parameter physical-natural resources, its capacity assessment seems easier due, more or less, to the "fixed" attributes of the elements constituting the parameter, as against the other two groups (b, c) of parameters which appear to be more "flexible" (interdependent with many other factors); then, assessment depends on diverse impacts/variables and contingent situations.

However, both socio-cultural and political-economic groups of parameters assume significant weight in assessing the carrying capacity of the area; practically due to the area's level of development (overall and in tourism per se) and the influential role such parameters (particularly the socio-economic) exert on the other.

The physical-ecological parameters

The total potential physical carrying capacity has been broadly estimated on the basis of existing (limited) information and assumed standards with regard to beach capacity and coastal visitors / accommodation capacity and with reference to the study area.

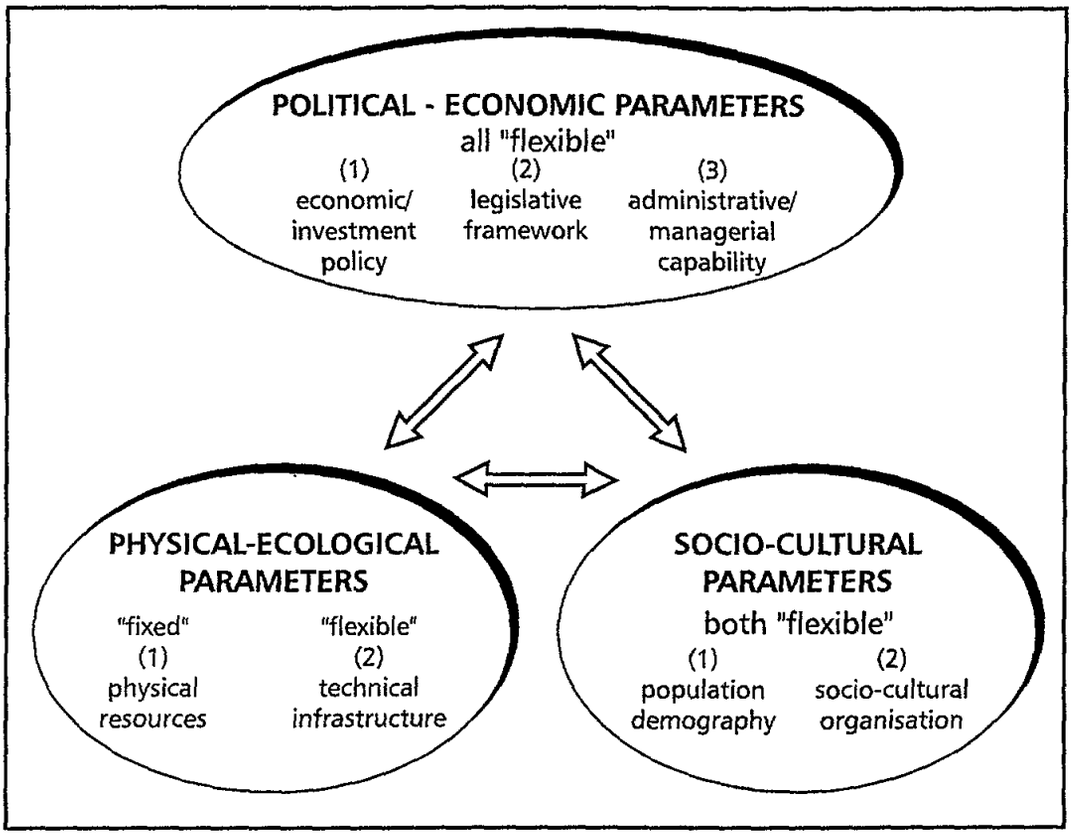

Diagram 3: Parameters of the STD Option

Beach Capacity

The estimated beach capacity[13] for the main study area ranges from 125,000 to 220,000 beach users/swimmers while for the adjacent coastal zones east and west the range is 94,000 to 150,000 users.

Visitors/Accommodation Capacity

On the same basis as above the visitors/accommodation capacity along the coastal zone[14] is estimated at 95,000 to 165,000 visitors/ beds for the main study area and 70,000 to 120,000 for the adjacent coastal zones.

The existing and potential capacity levels pertaining to the technical infrastructure networks refer to two main categories:

- the transport (road/rail/sea/air) and communication networks (infrastructure and services); and

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[13] This is a potential beach capacity, assuming a. the existence of proper accessibility, b. a coastline of 20 or 35 km for the study area and 15 or 25 km for the adjacent coastal zones, two alternatives corresponding to suitable bathing beaches of high and standard quality, c. a 50 m wide beach zone, and d. a beach use standard of 8 m^2 per swimmer/user.

[14] We are assuming 1 km wide coastal belt and a standard of 50 users per ha on this belt; the same for the two alternatives.

- The set of networks covering water supply, sewage collection/ /treatment and waste disposal systems.

Within the above context, one should notice generally that both categories of existing networks seem to impose limitations (short and medium term) on increasing tourism capacity levels. Properly planned intervention and development of infrastructure could increase considerably, in the long term the capacity levels.

The socio-cultural parameters

The socio-cultural parameters pertain to a particular set of elements or variables which define and characterise local communities. In our case and with regard to the STD option we are focusing on two categories: a. population and demographic structure (existing and future), and b. socio-cultural institutions/organisations (e.g. the "Tourists' Friends Society) and activities, as well as behavioural aspects and social interception patterns (hosts and guests).

The size of population[15] and its spatial distribution, but mainly high percentages of illiteracy and low educational/professional standards, as well as large percentages of young (under 15 years) population do not contribute to creating a sound economic base at least in the short term, and do not support large tourist inflows.

With regard to the region's (Governorate) administrative/institutional structure (apparatus and mechanisms) it is difficult to assess its potential/future capacity to support via technical and financial resources the area's cultural networks (infrastructure and services) or local/traditional activities. At present, such a capacity seems to be limited, considering the range of government and local initiatives with regard to the role living heritage and genius loci (i.e. the entire range of diverse cultural activities, such as traditional fairs, feasts, local rituals, etc.) play in attracting tourism.

With regard to existing and potential labour and employment capacity one should consider the whole range of constraints and potentialities pertaining to the production sectors; examining the effects of central government plans and policies for the area[16]; the growth rates by sector; and the degrees of flexibility each sector exhibits in adjusting to and meeting the changing intra- or extra regional demand conditions[17].

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[15] Existing population (1996 census): 212,000 for the Governorate and 80,000 for the larger Marsa Matrouh area; 53% in urban areas and 47% in rural (wide spreading of small settlements/dwellings) Projected population (year 2010): 253,000 for the Governorate, 190,000 for the larger Marsa Matrouh area and 63,000 for other towns and villages between El Alamein and El Salloum.

[16] Ministry of Planning (1977) The Fourth Five-Year Economic and Social Development Plan 1997/8 – 2001/2, Ministry of Planning, Cairo. According to the Plan, central government policies and investments are focusing and geared predominantly towards the agricultural sector and the housing/construction and infrastructure/utilities sectors.

[17] How the various traditional socio-economic systems (e.g. tribal/Bedouin) and organisational types (e.g. patriarchal relations) will evolve is difficult to assess.

With the two main sectors, the primary (agriculture and animal husbandry) and the tertiary (services and tourism) attracting the main employment potential in the area, the long-term employment needs for the STD option are estimated at 30,000-35,000 persons (qualified local labour force and seasonal migrant flows).

Considering the entire range of socio-cultural parameters, the long-term Carrying Capacity levels, relating local population (hosts) to visitor population (peak season / day guests), may not exceed the ratio 2.5 to 1 under the conditions/prerequisites of sustainability.

The political - economic parameters

The political - economic parameters seem to exert substantial influence in effecting and defining the Carrying Capacity levels. However, the influence of such dynamic parameters is not easily measurable due to their "flexibility" and the lack of sufficient information inputs. Drawing on the preceding analysis of the political-economic situation in Egypt and its effects on the study area, we may briefly outline certain issues of particular relevance to the STD option.

The future tourism policy may be seen as falling in and relating to the third of the three scenarios outlined in Section 5.2.

On the basis of this scenario, one may assume that the area's future tourism development will follow an integrated planning approach and co-ordinated management / control measures, different from present practices evidenced in the Fuka's "Integrated Tourism Centre" paradigm[18], a model that could have, if it prevails all over the area, negative impacts on the area's ICAM and STD.

Apart from the physical parameter which defines high carrying capacity levels, the other two parameters, the socio-cultural and the political-economic one, impose constraints. For example, there are limits posed by the local population characteristics and the availability of labour. The managerial parameter is also a constraint, regarding the volume of visitors both the public and the private sector can handle or cope with (operating staff in various services, budget constraints, etc.).

Thus, on the basis of the preceding analysis and an assumed ratio of local population/hosts to visitors/guests during the peak season/day of 3/1 – 2.5/1, we estimate the maximum accommodation capacity of the entire area ranging between 80,000 to 100,000 beds in total. If we count the existing accommodation capacities together with so-called "tourist resorts", for the future commercial tourism accommodation capacities the maximum can be about 40,000 to 50,000 beds. Considering the actual tendencies in issuing licences for secondary residence resorts, the limitation of such development is a prerequisite for achieving an STD option.

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[18] The study area of the CAMP Fuka-Matrouh falls under two development control jurisdictions: a. the coastal area from Matrouh up to 40 km eastwards under the Governorate's jurisdiction, and b. the rest 35 km to Fuka, including the Ras El-Hekma sector and the jurisdiction of TDA under the Ministry of Tourism.

6. TOURISM CARRYING CAPACITY ASSESSMENT OF THE FUKA-MATROUH COASTAL ZONE

6.1. Requirements Necessary to Achieve the Sustainable Tourism Development Scenario

The sustainable tourism development scenario corresponds actually to a long-term development model according to which, tourism, as an essential component of economic development contributes in a synergetic relationship to other productive sectors to the areas' continuous economic growth in a way which does not destroy the environment and the area's sound and attractive natural and socio-cultural resources are protected and upgraded.

This type of development presupposes and requires continuous efforts and co-ordinated actions among various actors. An overall frame of the main parameters involved in the process for attaining sustainable tourism development and the related conditions (requirements and objectives) are outlined in Diagram 4 and analysed below. Also, in this section we outline the main priority policy actions needed to achieve STD. Further analysis of requirements and specific proposals are undertaken in the following section and mainly in Section 6.5.

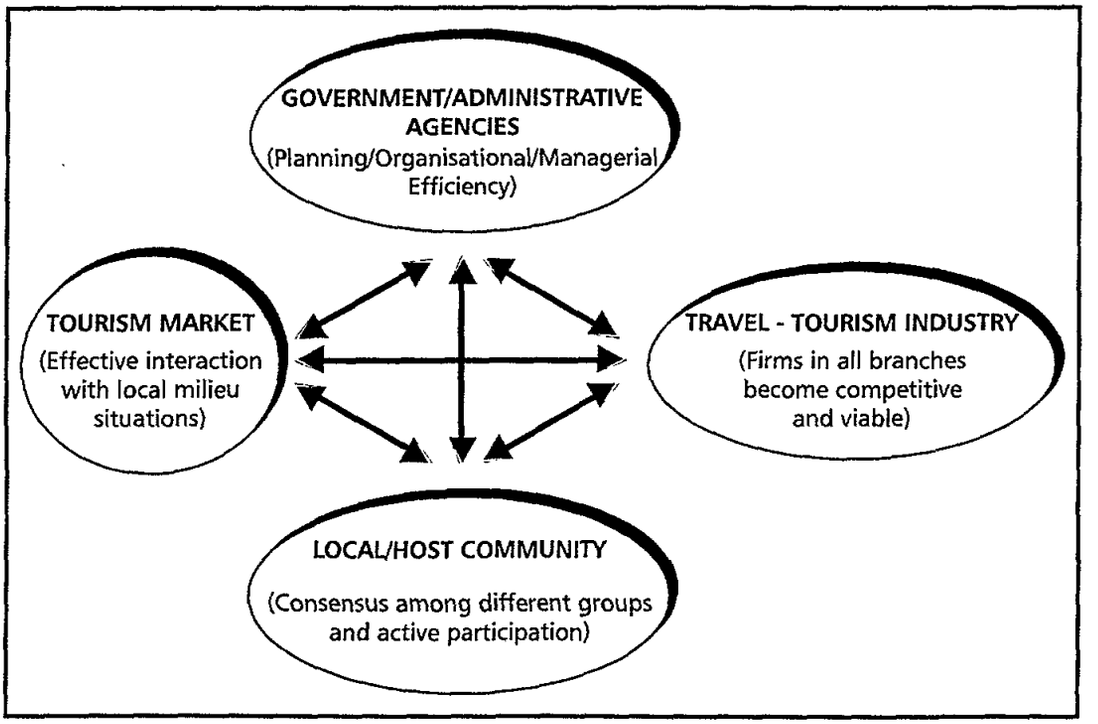


Diagram 4: Main Parameters and Conditions of Sustainable Tourism Development

6.1.1. The Framework of Parameters for Attaining STD

Parameter 1. Tourist Market: different segments of visitor population

a) Main requirements/prerequisites: tourists/guests show:

- authentic interest, knowledge and concern for local culture or socio-cultural activities; and
- willingness, flexibility and capability to adjust or modify behaviour during contacts and interactions or vis-à-vis local milieu situations.

b) Main objectives/outcomes:

- increased appreciation/respect for local socio-cultural activities and products: people, places, traditional activities;
- improved interaction/communication between hosts and guests;
- increased expenditures for buying local products – handicrafts; and
- qualitative upgrading or enhancement of tourist experience.

Parameter 2. Local/Host Community

a) Main requirements/prerequisites:

- increased sense of local identity/coherence and awareness/pragmatism in recognising development possibilities (weaknesses, advantages/strengths); and
- Maximum possible consensus/agreement among different local groups / agents / interests on major development aims.

b) Main objectives/outcomes:

- Increased satisfaction of local communities with levels and types of tourism development in connection with:
  - enlargement (larger share) of socio-economic benefits (incomes, employment) from increased tourist expenditures, and
  - substantial contribution of tourism to the protection and valorisation of natural and socio-cultural resources.

Parameter 3. Government/Administrative Agencies – Central/Regional/Local

a) Main requirements/prerequisites:

- rational diagnosis and evaluation of problems and development potential/opportunities in tourism; comprehensive planning approaches and appropriate legislative framework;
- co-ordination of tourism relevant policies among various agencies (of the tourism sector or of related sectors) at different spatial levels; and

- administrative/managerial efficiency for securing appropriate and continuous investments, inflows and adequate funds geared towards main tourism infrastructure and superstructure projects.

b) Main objectives/outcomes:

- reduction or minimisation of negative environmental impacts caused by exceeding capacity limits of resources;
- maximisation of tourism's socio-economic benefits to local communities and balanced spatially development; and
- secure long-term viability of investments and provide the best interlinkages of tourism with the other local productive sectors.

Parameter 4. Travel / Tourism Industry / Enterprises

Includes private and public firms operating in the accommodation/catering, transport, communications and cultural/entertainment sectors.

a) Main requirements/prerequisites:

- proper recognition of opportunities and development perspectives in conjunction to realising and rationally utilising existing investment opportunities;
- increased competitiveness and viability of existing (and future/prospective) tourist enterprises through enhanced/co-ordinated management and policy (investments/marketing); and
- creating conditions which encourage both local involvement and the development of various forms of partnerships (public/private, foreign/local) among prospective investors.

b) Main objectives/outcomes:

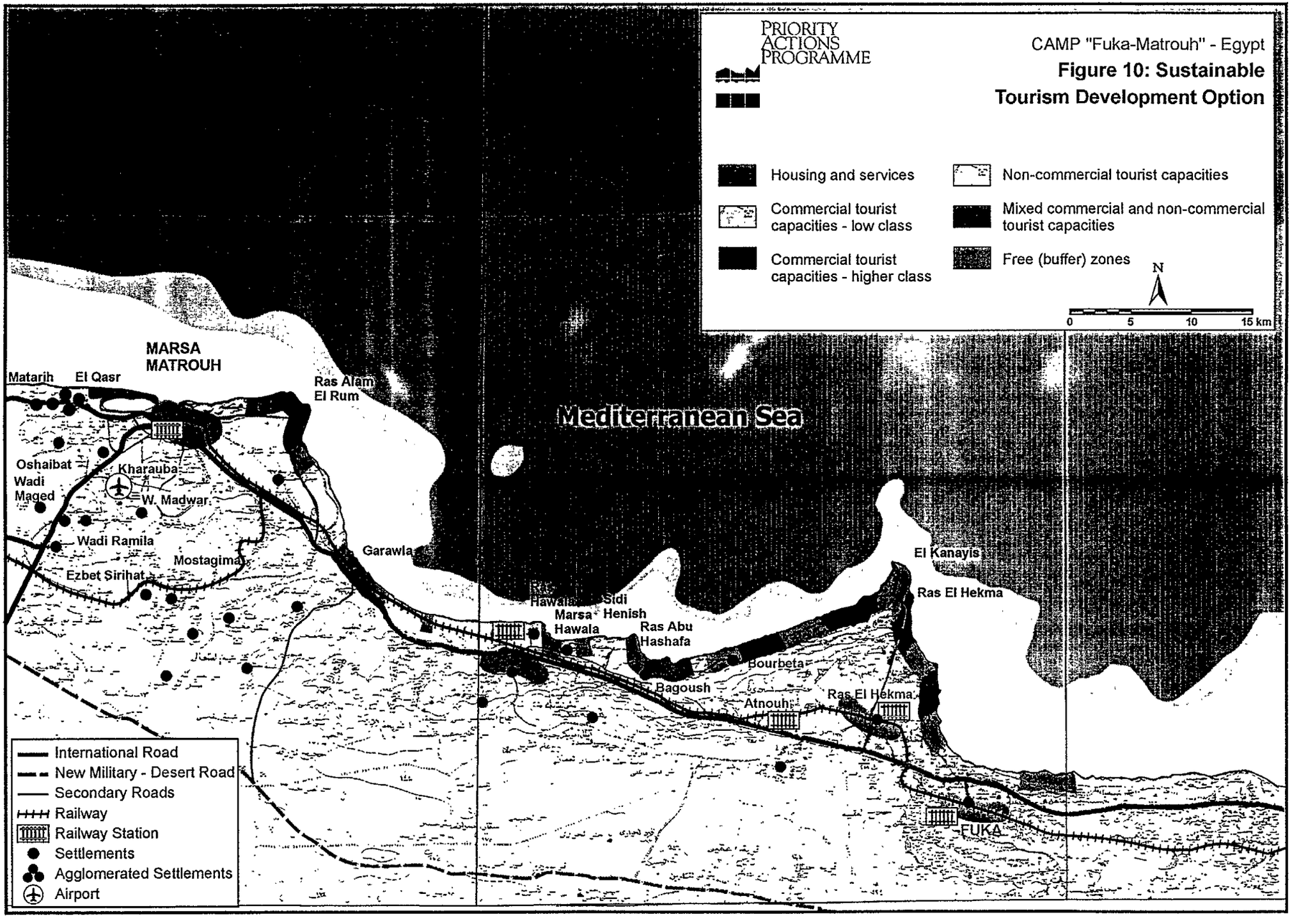
- increased contribution of the private sector to both the protection/valorisation of environmental resources and the development of cultural facilities leading to substantial local economic benefits (income, employment); and
- reduced negative environmental impacts (caused by over-use of sites and infrastructure) as a result of appropriate managerial policies (environment, auditing, etc.).

6.1.2. Main Interventions Required to Achieve STD: Priority Policy Actions

With regard to transport networks, priority (from a STD viewpoint) should be given to:

a) providing the infrastructure and services and reconditioning of the Marsa Matrouh airport; and

b) properly extending/upgrading the road network for supporting travel itineraries.


PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Figure 10: Sustainable Tourism Development Option
Housing and services
Commercial tourist capacities - low class
Commercial tourist capacities - higher class
Non-commercial tourist capacities
Mixed commercial and non-commercial tourist capacities
Free (buffer) zones
N
0 5 10 15 km
MARSA MATROUH
Matarih
El Qasr
Ras Alam El Rum
Mediterranean Sea
Oshaibat
Wadi Maged
Kharauba
W. Madwar
Wadi Ramila
Mostagima
Ezbet Sirihat
Garawla
Ras Hawala
Sidi Henish
Marsa Hawala
Ras Abu Hashafa
El Kanayis
Ras El Hekma
Bourbeta
Bagoush
Atnouh
Ras El Hekma
FUKA
International Road
New Military - Desert Road
Secondary Roads
Railway
Railway Station
Settlements
Agglomerated Settlements
Airport

With regard to the envisaged "new coastal highway", its feasibility and impact should be thoroughly investigated; perhaps it is not suggestible due to its detrimental effects to the coastal environment and the difficulty of avoiding of mass scale tourist buildings all over the coastal zone.

Two of the most serious and urgent problems pertain to the **water supply system** (related to water resources capacity and their proper distribution/management among the agricultural domestic consumption and the tourist sectors) and the **sewage** collection and treatment systems, which must at least triple their present capacity in order to serve the projected population (year 2010: 253,000) of the Governorate.

As it has been noticed earlier, the country-wide private tourism investments climate is quite favourable, although according to public governmental plans the region does not seem to be the focus, as other regions[19], for tourism-specific or overall development. Among the planning priorities, a long-term Tourism Investments Strategic Plan seems necessary. A plan drawn by the competent Tourism Development Authority of the study area and encompassing the whole range of programmes, projects and measures needed, as well as their timing, in two main areas:

- public investment for preserving and upgrading environmental resources, i.e. the various cultural sites and natural/ecological attractions; and
- private investments indicating the preferred accommodation types and locations for creating a diversified tourist product (which to-day is dominated by tourist villages / summer residences for the domestic market).

The existing legislative framework directly or indirectly concerned with environmental protection, land uses, coastal and urban development, etc. seems quite sufficient although for its proper implementation what seems to be needed is:

a) a more effective monitoring/enforcement system; and

b) certain additional legislative and institutional reforms and measures for regulating land ownership patterns, particularly in the agricultural sector and generally contributing to investments attraction and proper use of natural resources.

6.1.3. Inclusion of Existing Projects into the STD Option

There is a number of various studies about the Fuka-Matrouh area which are concerned with the capabilities of the region as well as the opportunities and issues that can contribute to or constrain the region's development. Those ideas can fit into the STD option and, therefore, have to be consulted in the future planning processes based on the STD option. The most important ones are "The Plan of the

[19] The relative low investment flow to the region by central government may also be attributed to the region's small population size.

North West Coast Comprehensive Development", "Tourism Development Plan of Ras El Hekma" and "TDA Study for Tourism Development in Ras El Hekma".

"The Plan of the North West Coast Comprehensive Development"

This plan was conducted by private consultants for the Ministry of Construction, New Settlements and Land Reclamation. The final report was accomplished in March 1986.

The main recommendations that can be drawn from this comprehensive development plan are as follows:

1. Provision of about 19,000 employment opportunities up to 2001.
2. 700 Million L.E. as total investments.
3. 100 million L.E. as added value resulted from the proposed economic activities.
4. The agricultural and animal husbandry are the main economic activities that would be dominant in the study area.
5. About 70 % of the total investment would be in the agriculture and tourism.

It should be noted that the plan takes into account the flexibility, funding resources and balance growth of the various economic activities according to the capabilities of the study area.

"Tourism Development Plan of Ras El Hekma"

This study was conducted by a private consultant for the Ministry of Tourism in 1988. The main conclusions of the plan are as follows:

1. There are certain areas within the study area which can be efficiently used as tourist areas. These areas include: Ras El Hekma, Bagouch and Hawala.
2. The areas located under the contour line of 100 meters are generally arable lands. The plan suggests that the areas located over the contour line of 100 meters are suitable for grazing activities which can be widely developed through the study area (Ras El Hekma).
3. In spite of the establishment and development of the industrial activities, it seems to be difficulties within the study area which could mainly be attributed to the shortage of power supply. The local handicraft and small business prevailing in the region can be developed.

According to the study of the resources and capabilities of the region, the plan suggests the agriculture and tourism to be the main activities that can be developed within the region of Fuka and Ras El Hekma. Meanwhile, the industrial activities have limited opportunities to be established in the region.

Finally, there are two main objections to this plan: firstly, it has neglected the social aspects of the development, and secondly, the plan pays attention only to the lands located in the north to the coastal road (Alexandria-Matrouh) and does not concern the areas located in the south to the road which actually has development

opportunities to absorb various economic activities rather than agriculture and tourism.

"TDA Study for Tourism Development in Ras El Hekma"

Another study about the same area, but concentrated on a smaller area at the Ras El Hekma peninsula was conducted by the TDA. According to this study, tourist demand forecasts for the area of Ras El-Hekma are as follows:

$$NoB = \frac{DoT \cdot NoN \cdot OR}{LoTS}$$

where:

NoB = Number of Beds;
DoT = Demand of Tourist;
NoN = Number of Nights;
OR = Occupancy Rate;
LOTS = Length of Tourist Stay.

Year	No. of beds
1990	1500
1995	1620
2000	1815
2005	2142
2010	2614

It is recommended that the area of Ras El-Hekma should be considered for tourism development of the first grade based on its natural beauty, international reputation and accessibility. Thereafter comes Fuka and the flat area from Sakih Moussa to the well of Atteya in the Ras El-Hekma Bay.

6.2. Physical Structure and Distribution of Tourism Development

6.2.1. Spatial Clustering Model as the Most Appropriate Choice for the Study Area

An appropriate spatial structure and physical distribution of tourism is a very important factor in attaining sustainable development. The attraction of tourist places depends on the way tourism activities and the related infrastructure are spatially distributed and / or integrated within particular physical and socio-cultural settings or territories, spaces and locations.

Specifically, the attraction of **tourist places** depends on certain parameters, such as:

- The distinctive properties and actions the particular locations exhibit and undertake, with regard to supporting efficient, in terms of factor costs and price market differentials, tourism production and consumption patterns;

- How efficiently localities or communities function as settings for particular interactions among different socio-cultural groups of local and visitor populations; and
- How well the particular territory or space manages to sustain and enhance those elements of nature and culture which constitute distinctive traits or assets of local milieu or genius loci.

The proposed spatial structure and physical distribution of tourism development in the study area is based on a model of **spatial clustering** which constitutes an **intermediate choice** between two alternatives: one of over-concentration of tourism, and the other of a complete dispersal of tourism development.

Elaborating on the issue of **tourism clustering**, underlying the chosen model for the study area and focusing on its operational aspects we delineate below its main advantages with reference to the criteria attached to the main dimension of tourism development.

The Economic Development Dimension

From an economic development standpoint the concentration (with proper spatial integration) and diversity/variety of the various branches of the **tourism industry** provides generally **increased multiplier and synergy effects.** Specifically it contributes to:

- A greater efficiency and lower costs of the necessary infrastructure and services, economising also on public facilities needed;
- Generating satisfactory visitor numbers and larger stays which consequently increase viability and ensure increased revenues in the accommodation and catering sector, as well as in other branches of the tourism industry and commercial supporting businesses; and
- Creating a more stable/reliable/skilled labour force and better quality local services.

The Environmental and Socio-cultural Dimension

Among the various positive effects the concentration of diverse market segments and tourism's superstructure and infrastructure could bring about the following are selectively outlined:

- The potential for enhancing various forms of interaction between hosts and guests, as well as for developing new or upgrading existing facilities, traditional products and activities; and
- The contribution such a clustering could have in conjunction with an appropriate system of travel itineraries (outlined below) to substantially preventing the dispersal/sprawl and environmental (natural resources) degradation.

The Management/Marketing/Promotional Dimension

The rational design and achievement of such a spatial pattern of tourism development could contribute to an easier management and control of tourism supply and services provided (leading also to better customer satisfaction) as well as to an increase of the synergistic effects (and viability) among certain of the provided attractions.

The proposed physical distribution of tourism development, based on the spatial clustering model, consists of two main components analysed in following chapters:

- The spatial configuration pattern of tourist superstructure (accommodation) and infrastructure (according to T.P. lines 1 and 2 – See 5.4); and
- The Network of Travel Itineraries.

6.2.2. Feasible Zones for Tourism Development According to GIS Suitability Analysis

Apart from general proposal for the spatial distribution of tourism development, it is necessary to locate more precisely the zones appropriate for the realisation of investment projects. That task was done by Geographic Information Systems (GIS) which have been based on all possible and available data on physical and socio-economic aspects of the Fuka-Matrouh area. The developed GIS contains specific data based on topographic maps, satellite image analysis, and field surveys. Each of the layers in the geographic database contains specific information required for site suitability analysis.

In this section, the analysis process is described briefly, starting with the identification of the objectives and criteria to be used, e.g. physical, legal, and environmental criteria. This is followed by a spatial land suitability analysis in order to identify potential areas suitable for different uses.

Criteria for Site Suitability Analysis

The ultimate objective of the suitability analysis is to identify suitable sites for new tourism development in the study area. Suitability depends on the characteristics of the site itself and on the locations of other facilities, as well as other requirements to minimise negative environmental impacts.

Specific sites will be selected if they meet pre-determined requirements, i.e. suitability criteria. The aim is to select areas that meet all or most criteria to the greatest extent possible and accordingly provide a priority listing of selected sites.

The legal and environmental criteria include buffer generation. Buffer generation is a geographic operation used when the analysis requires the identification of the areas surrounding geographic features. Buffers are used mainly to protect natural features.

The legal criteria used in the suitability analysis, based on Egyptian laws, include:

1. Location of any construction must be beyond 200 m beach set back of the shoreline, i.e. according to Environment Law No. 4/1994.

2. Development must be set beyond 50 m of highways road shoulders, railways, and major roads to avoid accidents, noise, and pollution hazards.

Other environmental criteria, suggested by the working team include:

3. Sites must be beyond 50 m of historical sites.
4. Sites must be beyond 50 m of wadies and wells.
5. The type of soil is an important criterion. It is necessary to choose soil types suitable for each activity of agriculture and pasture. Uncultivable soil will be then assessed for its suitability for tourism development.
6. Slope suitability is also an important criterion. Slopes for construction purposes should not exceed 10%.

According to these criteria, areas suitable for various uses are identified in terms of location, area and general characteristics, and after that shortlisted to those which are feasible for tourism development also from the economical point of view,[20] as shown on Figure 11. The listing of the areas was based on the merits of each selected area for tourism development, e.g. frontage of the sea and accessibility. Accordingly, the priority list of the selected areas was set as follows:

Area Number	Priority	Development Phase
1	First	First Phase
4	Second	Second Phase
6	Third	Third Phase
2, 3, 5	Fourth	Fourth Phase

The areas number 2, 3 and 5 will be feasible for development as a fourth stage when access to the beach is provided.

The carrying capacity for tourism development of the beach areas was estimated between 15,000 and 75,000 persons depending on the quality of the accommodation establishments, what fits into the general estimation of the beach carrying capacity for the whole study area between 40,000 and 50,000 for the new establishments and between 80,000 and 100,000 together with the existing "tourist resorts" and those under construction.

Some recent experiences have shown that beach capacity does not need to be the only limiting parameter in the total tourism carrying capacity even for the predominantly sunbathing destinations regardless of the quality of the accommodation establishments. It is especially a case in urbanised areas with a lot of entertainment, sport and shopping facilities and where there are various possibilities for excursions and other forms of activity outside the accommodation objects. The modern tendency to use hotel/tourist resort pools instead of natural beach and to avoid long exposure to the sun are also important factors that reduce pressure to the coast.

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[20] That includes only areas north from the Matrouh-Alexandria motorway, i.e. areas close to the coastline.

Land suitable for tourism development
Roads
Railway
Mediterranean Sea
Ras El-Hekma
PRIORITY ACTIONS PROGRAMME
CAMP "Fuka-Matrouh" - Egypt
Figure 11: Areas Suitable for Tourism Development

Nevertheless, it has to be mentioned that some of the existing "tourist resorts" (holiday homes) are built outside feasible areas, and it is likely that some new commercial capacities can also be built outside those areas. It is happening because closeness to the coast and to the motorway is still more important than other factors due to lower investment costs and overall image of the Fuka- Matrouh study area as primarily beach destination. Therefore, it is not likely that in the near future there will be serious interest of possible investors to use the interior of the study area.

6.3. Tourism Accommodation Capacities and Their Structure

On the basis of the overall maximum accommodation capacity levels (80,000 to 100,000 beds) and for mainly new capacities (40,000-50,000 beds) defined in the STD option (Section 5.4) as well as certain conclusions of the preceding analysis, we are suggesting a broad spatial configuration pattern of accommodation for the study area.

A more detailed spatial configuration of tourist accommodation should follow and relate to specific land-use plans and policies, i.e. detailed evaluation of the existing spatial distribution patterns, and final ICAM proposals. Based on the suggested broad spatial configuration pattern, we should emphasise the following:

- In both cases, location-wise tourist accommodation should be functionally/ /organically (regarding socio-economic inputs) and physically (regarding technical infrastructure) related to, or integrated within the existing towns or settlements' network; and
- Accommodation should concentrate in specific zones of tourist development potentially identified or determined in the general and tourism-specific Land-use Plans avoiding the sprawl of accommodation units along the coastline or the uncontrolled linear development of "independent, self-serviced" tourist settlements.

	Number of beds	Main accommodation types
Marsa Matrouh - Fuka Study Area		
Marsa Matrouh urban Area	25,000 - 30,000	Mainly hotel complexes fully equipped with supporting infrastructure facilities and services to cater for diverse activities
Area (coastal + inland) between Marsa Matrouh and Fuka	15,000 - 20,000	Different accommodation types: hotel units or complexes, camping sites, tourist resorts (with specific lodging forms)
TOTAL	40,000 - 50,000	

Table 4: Spatial distribution of Tourism Superstructure (Maximum capacity levels and broad types of accommodation)

A properly designed and operating Network of Travel Itineraries System (N.T.I) contributes to mitigating problems of seasonal over-concentration (wear and tear of infrastructure), or over-capacity and substantially prevents the degradation of environmental resources. It also contributes, through the **organised spatial distribution** of visitors over the study area to a more equal distribution of socio-economic benefits derived from tourism.

The proposed N.T.I.[21] is based on the defined structure of the T.P. and market and the envisaged long-term development of the infrastructure/transport networks (see also Section 6.5). It consists of two main types of travel itineraries:

A. Short range tours (regarding time and spatial coverage) or trips with a single or a few destinations, consisting of day excursions, or overnight/weekend visits to specific attractions or for particular activities.

These trips have usually one "base centre" and may be of a cyclic/full orbit type, or of a single/partial one (same route or path of return). Examples: with Marsa Matrouh or Siwa as "base centres/camps" short day trips to coastal attractions west of Matrouh (e.g. Al Abiad, Agiba) or to attractions surrounding Siwa (Khamish, Bilad Al Rom, Doric Temple, Behadin, etc.).

B. Intermediate and **long range** or multiple destination trips, consisting mainly of 3-4 day excursions with a particular thematic concept (e.g. touring western desert/Quattarah depression) or encompassing visits to diverse cultural and natural attractions.

The major centre of the entire N.T.I. is Marsa Matrouh, where the majority of foreign tourists arrive today and in the future by plane or through Alexandria and Cairo. Apart from the majority of the necessary infrastructure and services (hotel chains offering organised trips, travel and car rental agencies, etc.) concentrating in Marsa Matrouh, it seems expedient to establish here a special "Touring Planning and management Centre" providing pertinent information to visitors, as well as managerial/operational support to the network (e.g. suggesting ways or re-routing visitors in cases of bottlenecks or when threshold levels are reached).

The second in importance "base centre" is Siwa, providing services for both types of travel itineraries particularly during the winter, while two more smaller (for short range trips) "base centres" may be envisaged in locations to be chosen among the centres of Fuka, El Dabba, Sidi Abdel Rahman and El Alamein.

With regard to the **capacity** of the entire N.T.I and assuming that one in four tourists visiting the area during a peak season's day will be touring, we have a travel itinerary capacity of 25,000 people, including those for whom the Fuka-Matrouh area and its wider region is only part of a multi-region itinerary within Egypt.

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[21] The N.T.I. is here very broadly indicated. A special study should be undertaken to define in detail such a network.

6.4. Tourism Services and Support Activities

One of the crucial characteristics of the economic situation in the area regarding tourism is a dependence on the beach tourism and at the same time a limited space for such development due to already high pressure on the coast by so-called "tourist resorts". In such circumstances, various and well equipped support activities and services play an extremely important role in order to disperse tourists from the beaches. At the same time, the area by itself cannot offer many possibilities for the desirable dispersion, due to relatively weak attractions outside beaches. Furthermore, there is a strong need to import almost everything from the other parts of Egypt or abroad, because the area does not offer many goods that can be sold directly to tourists due to its physical characteristics.

The actual situation regarding services and support activities is much worse than in other parts of Egypt, because the area still does not have a strong tourist image. Considering extreme importance of supporting activities in order to attract tourist investments in the area and adequate efficacy, certain measures have to be undertaken in order to stimulate the development of those activities, especially outside coastal tourist areas. That includes:

- various shopping possibilities, including big shopping centres (mainly in Marsa Matrouh, but also in some other places, such as Garawla, Hawala, Abu Hagag and close to tourist areas);
- various sport and entertainment activities outside coastal areas, especially for children (amusement centres, playgrounds, etc.);
- rent-a-car service and adequate local bus services between Marsa Matrouh and main tourist areas;
- adequate information services in foreign (English) language in Marsa Matrouh and on a smaller scale in other important settlements and tourist areas, including adequate signing in Marsa Matrouh and other points of interest;
- adequate interpretation and informational tools in order to stimulate tourists to explore the whole region (maps with marked tourist attractions, interpretation panels in front of key tourist attractions, etc.); and
- organisation of special events using key attractions like the old Egyptian history (Cleopatra beach, Ptolemeus fleet), the Second World War history, and the local Bedouin culture (Folk dances, special events in the desert).

It is also important to adapt as much as possible local food production and crafts for tourism purposes in order to avoid high transport costs either to the area (especially for tourists), or from the area. Such policy can at the same time increase the profitability of local production and offer more employment possibilities, especially for less qualified persons. Many actions in that direction will, therefore, be included in the following final chapter.

6.5. Tourism Development Programme Proposal in Space and Time

On the basis of the preceding analysis, the proposed programme of tourism development is synoptically presented below, outlining its three main interdependent directions of planned intervention over time and space.

Direction A: Tourist Product Development Plan

This Plan of Tourist Product Development consists of **three main components** of relevant policy actions which are co-ordinated in time and space to attain the envisaged Tourist Product.

Component A1

This encompasses two main development targets:

- The **qualitative upgrading** of the existing accommodation potential and of the tourist infrastructure in the area; and
- The development of **new tourist superstructure** or accommodation types according to the envisaged Product Lines Structure (Section 5.4).

With regard to the first target, the **upgrading** has to do with the accommodation's /buildings physical renewal and mainly with enriching the existing and providing new supporting facilities (related to catering, shopping, sports, entertainment) to the accommodation units. Such facilities should be planned in conjunction with those proposed and encompassed in Components B and C below.

With regard to the second target, the **new accommodation** should be realised progressively according to a specific long-term Accommodation Development Programme. The Programme's main objective is the functional/organic (population, employment) and physical (land uses, technical infrastructure) **integration** of new accommodation within the urban/ekistic and settlements fabric, avoiding incremental development. The Programme should follow the previously suggested (Section 6.2, 6.3, 6.4) measures, as well as those proposed in the following Directions B and C.

Component A2

This focuses on diversifying the T.P. (and tourist consumption opportunities) by developing new or alternative tourism activities related to and utilising the region's environmental attractions. The combined development of infrastructure (facilities and services) with measures (land-use regulations) to protect/enhance the environmental resources should be directed from a priority of time and spatial orientation point of view towards the following areas:

- **The Coastal Areas**, giving priority to certain beaches East (e.g. Ras Hawala, Ras El Hekma) and West (e.g. Al Abiad, Agieba) of Marsa Matrouh and providing facilities for diverse beach/sea activities, within specifically delineated recreation and park zones connected with a series of linear "green

belts" in such a way as to enhance the "open space" character of the entire coastal area.

- **The Siwa Oasis** wider area (including the Quattara depression) focusing on the development of a multifacious set of facilities/services for attracting health/therapeutic tourism (Siwa as a spa centre), ecotourism, cultural and adventure travel (Siwa as a centre of safari expeditions/desert travel).
- **The Marsa Matrouh** urban area as the region's major all-year around tourism destination, providing particular facilities related to congresses/conventions, exhibitions, festivals, athletic/sport activities, as well as to health/fitness. With regard to the latter, one should examine the feasibility of establishing in Marsa Matrouh a centre of thalassotherapy (using mineral-rich sea water and whirlpool baths) separate or within a particular accommodation complex.
- **Specific locations** all over the area with development priorities on restoring/rehabilitating and extending the infrastructure related to historic sites (e.g. Abu Mena a principal attraction as a pilgrimage centre), monuments/temples, etc.

Component A3

This pertains to creating those facilities and services needed for the development and operation of the entire set of travel itineraries outlined in Section 6.2 (see also Section 5.4). Most of these facilities and services pertain to:

- The construction of specific **tourism networks** (road/cycle/camel/walk) following the spatial distribution of scenic attractions and specific tour circuits of the countryside; and
- The development of specific **services** (e.g. information centres, car rentals touring/coach companies, etc. separate or liaised with accommodation enterprises) concentrated in particular locations, mainly in Marsa Matrouh, but also in Siwa and certain (2-3) smaller "base camps" for short range trips (e.g. choice between Fuka, Sidi Abd El Rahman, Hawala, El Alamein, El Dabba).

Direction B: Tourism Specific Policy Measures

The tourism specific policy measures relate to both Direction A (above) and C (following) and are grouped into two main categories outlined below as follows:

B1 Investment/Financial Policy Measures

Generally/world-wide the promotion or encouragement of tourism investments in developing countries depends mainly on the public sector's efficacy and certain interrelated factors, such as:

- The type of legislation and the functionality of regulatory regime;
- The strength, coverage (hotel sector alone or travel industry as a whole) and influence of incentives or the various financial sources: international,

multilateral/bilateral grant loans and aid, government public financing, commercial and development banks; and

- Existing regulatory frame concerning foreign ownership (land, property) and foreign exchange regime.

The promotion of private sector investments in the study area will greatly depend on the policies adopted and promoted mainly by the relevant central government authorities; on the entire investment regime/climate which has been considered by certain analysis[22] favourable for Egypt as a whole; and on tax exemptions (up to 10 years), the unrestricted ownership of capital, reduced import duties and freedom of profits repatriation.

The key policy measures that should be adopted for the future development tourism in the Fuka-Matrouh area must be geared towards:

- Securing sufficient/adequate **public financial resources** for providing the basic infrastructure supportive of tourism development (see Direction C below);
- Encouraging **joint funding** between the **government** (central/regional) and the **private** sector, or financing jointly (syndicated financing) by the state-owned and private banks particular projects or programmes pertaining to: i) education/training, ii) developing/promoting heritage (cultural/natural) attractions and resources, and iii) innovating/upgrading or establishing new services and infrastructure in specific areas (travel-transport-marketing);
- Securing long-term funding from specialised **international financial institutions** to support, selectively, the development, by private sector of specific (spatially defined) integrated tourism resorts or centres and, in relation to the above; and
- Establishing, at the Governorate level, a Tourism Development Corporation, related to the existing "Regional Committee for Planning and Development of Tourism" and with a major aim to attract and use investments and secure multilateral or bilateral aid/grants/loans by international Agents (UNDP, WTO, IFC, the World Bank) in various forms in order to develop specific tourist infrastructure in the Fuka-Matrouh area providing serviced sites on which particular types of tourism (e.g. resorts) develop[23].

B2 Managerial/Educational Policy Measures

Among the various managerial policy measures pertaining to private and public tourism agents we are emphasising those pertaining to **marketing** and the environment or specifically **environmental auditing.**

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[22] Economist Intelligence Unit: International Tourism Reports, No 2, 1996.

[23] A similar paradigm has been adopted on the Red Sea coast, where an established public sector agency is responsible for the overall design, the management of the World Bank's loan, the co-ordination of commercial Egyptian companies, for constructing specific projects, and international companies (e.g. Sheraton, Robinson's Club) for operating the resorts.

The Governorate authority responsible for tourism ("Regional Committee for Planning and Development of Tourism") in collaboration with the central authorities (Ministry of Tourism / TDA) should develop a **Strategic Tourism Marketing Plan** for the entire area. On the basis of such plan the authority should establish an overall budget for marketing and the appropriate marketing mix: budget allocation/distribution based on a concrete set of marketing tools (promotion, prices, new products development, etc.).

Environmental Auditing (E-A) aims at controlling overcrowding over-development (following CCA guidelines) and pollution and at ensuring the areas ability to cope with visitors. Various types of E-A applied equally well by both private and public agents can reduce or prevent environmental damage and enhance quality for both tourist firms and destination authorities. E-A is a major component of an environmental management system for tourism enterprises acting to reduce negative environmental impacts of their activities. It must be undertaken regularly (to check the firm's compliance with the adorsed objectives) and it can result in commercial benefits, e.g. cost reduction from waste minimisation, and safety/protection for both employees and visitors. The adoption and use of an E-A system must be seen as a long-term objective; it is established on a voluntary basis and is based on an appropriate and widely accepted legislative framework[24].

Equally important are educational policy measures that should be undertaken by both **public** and **private** agents in order to achieve certain objectives, such as:

- Upgrade existing inadequately trained, or new personnel, in the hotel/catering branch or other branches of the tourism industry;
- Support traditional professional skills and practices regarding local productive and socio-cultural activities (handicrafts, cuisine, etc.) to promote increased local inputs (and benefits) in the production and consumption of the tourism product; and
- To promote environment friendly behaviour and/or raise awareness sensitivity of both locals and visitors contributing to reduction or avoidance of negative environmental effects (e.g. the littering of beaches or depletion of vegetation and dunes, etc.).

The design selection and implementation of specific programmes (professional training, environmental awareness or specific programmes) should consider the above objectives - setting priorities according to a certain scale, as well as criteria of cost-effectiveness taking into consideration that tourism training institutions require substantial human and financial resources.

Direction C: Broader Context of Policy Measures

Tourism's sustainable development is inseparable from the development of other economic and social activities (public or private) in the entire Governorate area.

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[24] E-A, even today, is a minority business management practice within the tourism industry of developed countries; in the United Kingdom, for example, it is confined to new large firms.

Obviously, tourism and environmental quality are strongly affected by the size/amount, intensity and the type or quality of certain other activities taking place, such as agricultural, industrial/commercial, construction and building, cultural and entertainment, health and educational. Due to the multifaceted nature or idiomorphy of tourism an integral tourism development programme should relate to and materialise in parallel and in conjunction with programmes and policy measures of other sectors. Selectively, we outline below those intervention policies and measures considered to have the greatest synergy effects on tourism.

C1. Technical Infrastructure Networks

With regard to the overall technical infrastructure networks among those considered to have development priority are the transport (rail/road/air) networks (discussed earlier in Section 6.1), the completion of the construction of the sewage collection and treatment system, particularly in the Marsa Matrouh area, as well as of the drinking water pipeline from Alexandria covering the major built-up areas.

Regarding the **water resources** of the entire Governorate area a longer-term objective is the preservation, enhancement and rational use of water resources (by different user groups); and focusing on controlling/limiting the over-exploitation or overuse of water resources, particularly in certain areas (e.g. in coastal aquifers prone to saltwater incursion). To this end, it is suggested to implement a specific programme which indicates the necessary projects/infrastructure and prescribes all pertinent regulation/guidelines (e.g. feasible/economic irrigation methods, drilling of wells, etc.) for using and managing the water resources.

C2. Environmental Protection/Enhancement and Land-use Management

Together with establishing a branch of the Central Environmental Affairs Agency at the Matrouh Governorate, the establishment of environmental monitoring stations in appropriate locations and of a research centre (collection/analysis of data, design of specific policy measures for environmental protection) are considered priority measures for the area.

Also, as a priority one should consider the establishment of **new natural reserves**, apart from the existing one (Al Omayed) and after investigating their feasibility and Terms of Reference (Law 102/1983). Within a wider context of considering the importance of natural/environmental resources for tourism, one could suggest the design and implementation of a **regional vegetation strategy**. This involves, among others, the selection of the most suitable indigenous species (grasses, legumes, shrubs, herbs, trees, etc.) for their preservation and further development in conjunction with:

- The agricultural sector's production targets and policy measures (e.g. grazing control measures); and
- The provisions envisaged in the ICAM plan with regard to the zonal division (3 zones) of the study area.

The issues of land-use management, briefly discussed in Section 4.4 within the context of land-use planning policy are crucial for the proper integration of tourism

within the area's environment. However, the idiomorphy of tourism suggests that, generally, the management of tourism related land uses should be fully integrated within broader Land-use Management Plans, for example, urban tourism land uses within a Town's Land-use Management Plan (and following the related town planning/building regulations) or the tourism's coastal land uses within the ICAM plan. In particular cases of site planning (e.g. resort types of tourism development) land-use management should come under particular regulations through specific legislative acts setting conditions or requirements for enacting specific control measures by the relevant authorities.

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