EGYPT: SECOND MATRUH RESOURCE MANAGEMENT PROJECT (MRMP II)

ENVIRONMENTAL MANAGEMENT PLAN

I. OBJECTIVE

The objective of this Environmental Management Plan (EMP) is to identify the environmental mitigation measures, screening process, capacity-building and monitoring activities that will be undertaken, as well as the institutional arrangements that will be set up, during implementation of the MRMP II to ensure that any potential adverse environmental impacts are either eliminated or minimised. The EMP also proposes an implementation schedule for undertaking these activities and indicates their costs included in the project budget.

II. MAIN ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The overall environmental impacts of the MRMP II are expected to be positive, including increased environmental awareness (particularly among women), improved range and watershed management, sustainable agricultural practices, enhanced biodiversity conservation, and expanded protected area management. The project will not negatively alter the ecosystem nor cause significant environmental harm during the undertaking of water harvesting and road construction works. The inclusion of the Global Environment Facility (GEF) component will ensure that environmental considerations are mainstreamed in the MRMP II by seconding Egyptian Environmental Affairs Agency (EEAA) staff to the MRMP II Project Coordination Unit (PCU) and strengthening the capacity of environmental staff in the Matruh Governorate's Environmental Management Unit (EMU). Furthermore, the GEF component will finance, among other activities, the establishment and management of two protected areas at Saloum and El Qasr within the project area.

A. ANTICIPATED ENVIRONMENTAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

Overall, activities financed under the MRMP II will have positive environmental impacts. The environmental benefits from project activities in MRMP I are noticeable and will continue to be so in MRMP II – indeed the very fabric of the project is to improve the natural resource base in order to alleviate poverty. The Environmental Assessment (EA) identified the following issues, addressed below, for which potential impacts and mitigation measures are detailed:

1. Drinking Water Quality: In discussions with PCU technical staff the EA identified drinking water quality as the primary potential issue related to the water harvesting activities of the MRMP II. A 1994 GTZ water analysis of selected cisterns in the North West Coastal Zone concluded that concentrations of *E. coli* (indicator enterobacterium for bacteriological contamination) in water collected from cisterns were 1,000-10,000 times WHO guidelines. (*E Coli* are a particular type of coliform bacteria whose presence in drinking water is more serious than other coliform bacteria because they are disease-causing. They indicate that water has been contaminated by sewage or animal wastes that contain other disease-causing micro-organisms which can cause severe diarrhoea, cramps, and nausea.) Unfortunately, no more recent water quality data are available. While discussions with the local population on

the most prevalent diseases indicated that the above water-related diseases were not perceived as the highest importance (diseases related to malnutrion and eye infections were the most frequently quoted), it is recommended as a matter of prudence to implement proper mitigation measures to minimize any potential risks.

Source Mitigation Measures. Mitigation measures at the source include improved water management practices and water quality monitoring:

- Cisterns will be dredged approximately every three years to restore the dead storage capacity taken up by sedimentation. (Silt loads captured thanks to silt traps, while minimal in quantity, may be re-utilised as organic fertiliser in agricultural areas, as they may contain a certain level of nutrient washed away from topsoil by wind and water erosion.)
- Ideally, animals would be kept away from the cisterns used for drinking water, or at least away from the part that serves as the catchment area. In addition, wherever possible, separate cisterns should be built for human and animal purposes, instead of cisterns that provide for both uses contemporaneously. However, since most of the smaller families with limited income levels would have difficulties in drawing such a distinction (since they will only have one cistern for use by the family, for supplementary irrigation and for stock watering), water management practices that could be adopted by lower-income families will require that animal drinking troughs be kept away from human-purpose cisterns, and use project- supplied hand pumps and hose to convey water to the animals at a distance of about 30 meters away.
- Cisterns specifically used as potable water sources for humans should be closed during the first rainfall and re-opened at the second. It is also recommended that cisterns be closed during the first 10-15 minutes of every rainfall. Although these recommendations may be difficult to implement given the extreme shortage of water in the region, project beneficiaries should regardless be advised of this option.
- A new drinking water quality analysis will be undertaken by the MRMP II in collaboration with the Ministry of Health, and periodic water quality monitoring will be incorporated into the project monitoring program.

Water Treatment Mitigation Measures Treatment mitigation measures involve the sterilisation of water. This will require further work in the context of MRMP II, in addressing the various alternatives to water sterilisation. Some options to obtaining sterilised drinking water are suggested in Annex 1.

- The MRMP II will undertake awareness-raising with respect to improving drinking water quality (promoting filtering, Solar Water Disinfection (SODIS), chlorination, or boiling water, as appropriate) in the local communities, primarily among women.
- The MRMP II will study appropriate alternative renewable energy sources for power generation for water treatment[1], and consider the provision of various types of stoves (using renewable energy) for cooking and boiling water. Solar and wind energy options will be explored and demonstration units established at each community, with cost-benefit analyses conducted.

2. Planning and Implementation of Range Rehabilitation Units: The EA also identified potential environmental impacts related to the range rehabilitation activities of the MRMP II.

[1] Alternative energy sources will also be sought to power micro-enterprises in the remote rural communities of the project area

The location/spacing of "biodiversity islands" (range protected areas) should be planned, and a map of proposed areas developed, to incorporate possible corridors (e.g. for wildlife), but also to maintain a connectivity between the areas for habitat (such as habitat for pollinators). Minimum tillage should be practised, as excessive tillage promotes wind and water erosion. Nutrient management also needs to be optimised. Silt captured from silt traps, animal waste, and human excrement collected from latrines are rich in nutrients and could be used as organic fertiliser. A more detailed description of the proposed mitigation measures is given in the Environmental Guidelines Manual.

3. Construction of Small Sub-projects (community centres, latrines and cisterns): Finally, the EA identified potential environmental impacts from the small-scale infrastructure sub-projects and rural roads financed by the MRMP II. Planning the location of these sub-projects should be done through a participatory approach and addressed in the Community Action Plans. Construction and operation of the structures should follow the good practices/mitigation measures outlined in the Environmental Guidelines Manual. The construction of cisterns must: (i) incorporate a silt trap, sediment basin and sieve on the inlet side of the cistern to reduce the sediment load; (ii) separate cisterns for drinking water from those for animal and irrigation purposes; and (iii) avoid collecting water from the first rainfall as this carries the highest level of pathogenic micro-organisms. Contamination by animal waste should be avoided, and training should be provided on the long-term maintenance of these structures.

4. Rural Roads: Roads should be selected through a participatory approach and designed to interrupt cross-drainage as little as possible. Where the road interrupts natural drainage, culverts and siphons will be installed. Road design should ensure that roads will not significantly impede the passage of wildlife. Road construction will ensure, to the degree possible, non-susceptibility to erosion from floods by planting trees along the road to act as wind breaks and soil fixators. Construction and maintenance should follow the guidance provided in the Environmental Guidelines Manual.

B. ENVIRONMENTAL SCREENING OF SUB-PROJECTS

To ensure that sub-projects financed under the MRMP II are in compliance with Egyptian environmental requirements (and consistent with World Bank safeguard policies), all sub-projects with potential adverse environmental impacts will undergo environmental screening as detailed in the Environmental Guidelines Manual prepared for the MRMP II. In summary, the review process will involve the use of environmental screening checklists (prepared with and reviewed by PCU staff) to ensure environmental safeguard compliance and to determine whether sub-projects require formal review in accordance with procedures established by the EEAA in its Guidelines for Environmental Impact Assessment (EIA Guidelines). The EIA Guidelines implement the EIA requirements of Environmental Law No. 4/1994 and its Executive Regulations and establish the procedures for environmental screening and approval of projects with potential environmental impacts by EEAA. The MRMP II will utilise the checklist screening process and EEAA EIA Guidelines to meet the environmental assessment safeguard requirements of World Bank OP 4.01.[2]

Under the EIA Guidelines, projects with potential negative environmental impacts are classified into three colour-coded categories according to the severity of environmental impacts:

- **White list** projects for those with minor environmental impacts
- **Grey list** projects for those that may result in substantial environmental impacts
- **Black list** projects for those that may require complete EIA due to potential severity of impacts

The EA determined that the vast majority of MRMP II sub-projects with potential adverse environmental impacts are small in scale with minimal impact and thus are not expected to require formal EEAA review. A few sub-projects, e.g., rural roads, may be **white list** projects and thus require EEAA or Matruh EMU review. No MRMP II sub-projects are expected to be **grey list** or **black list** projects. The EIA Guidelines set out the procedures for complying with the EIA requirements. The level of environmental screening and procedures for review and approval by EEAA vary by category and are detailed in the Environmental Guidelines Manual. The PCU will ensure that MRMP II sub-projects comply with these screening procedures.

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[2] Other safeguards that have been addressed by the EA are.

OD 4 20 (Indigenous Peoples) The objective at the center of OD 4.20 is to ensure that indigenous peoples do not suffer adverse effects during the development process In the case of MRMP II, indigenous peoples (Bedouins) comprise the entire population living in the target area, and therefore OP 4 20 is triggered However, since the Bedouins are the sole Project beneficiaries, the MRMP II is designed through a thorough participatory process, and all project interventions have been designed with the improvement of the status of the Bedouins (poverty alleviation, access to water, improved rangeland management, social well-being, etc), there is no need for the preparation of an Indigenous Peoples Development Plan

OP 4 12 (Involuntary Resettlement) The project will undertake the identification and declaration of two protected areas (PAs) in the project zone These will be defined based on their biodiversity significance, status of degradation and potential for conservation and alternative economic activities that can be built on the new conservation status. This will be undertaken with the full participation of the local communities in the identification of the PAs and the design and implementation of the PA management plans, as is the case in other similar established PAs in Egypt. The issue of loss of income or means of livelihoods resulting from the delineation and declaration of protected areas under the project will be assessed based on the definition of the exact boundaries following preparatory and consultation phases with the stakeholders and local communities, which is expected to take two years Prior to appraisal, the team will prepare a Process Framework outlining the steps and participatory process by which the PA component will be prepared, and the criteria for eligibility of displaced persons will be determined. If the creation of the PAs does result in the displacement of persons, the means to assist these persons in their efforts to improve their livelihoods or at least restore them, will be addressed, and potential conflict resolution mechanisms and monitoring and follow-up arrangements will be presented

III. ENVIRONMENTAL TRAINING AND CAPACITY PROGRAM

In order to ensure proper implementation of environmental screening and mitigation measures, as well as effective watershed and range management, biodiversity conservation, and protected area preparation and management, the MRMP II will undertake an intensive program of environmental training and institutional capacity building.

A. ENVIRONMENTAL TRAINING FOR PCU/EEAA/EMU STAFF AND LOCAL COMMUNITIES

The MRMP II will provide national and international experts to deliver training to PCU management and staff, EEAA field staff, and Matruh EMU personnel designed to build capacity for effective environmental management under the project, including environmental review, assessment, and mitigation of all significant project-financed activities and implementation of the integrated ecosystem management approaches supported by the project. Such training will cover environmental policy and regulations, range resource inventory and evaluation, carbon sequestration and biomass inventory, socio-economic surveying, species monitoring and evaluation, protected area management, and participatory training on the specific environmental issues and mitigation measures identified by the EA. It will also include training trainers and providing refresher courses in all of the topics identified.

As part of the Community Development component, the MRMP II will provide basic training to local community representatives and members of the wider community in integrated environmental management/protection and environmental screening/impact assessment, and biodiversity/range management practices. Also, to strengthen development capacity among women in the communities, the MRMP II will promote environmental awareness programs to assist women in effective management of potable water resources and in sustainable utilisation and management of the natural resource base. The GEF activities will promote formal and informal environmental education, including the design of curricula and preparation of educational materials, in the schools and at the community centres in the project area.

B. CAPACITY BUILDING FOR THE PCU, EEAA, AND MATRUH GOVERNORATE EMU

The MRMP II will build environmental management capacity within the PCU by establishing a new Natural Resource Management Department comprising units for Land and Watershed Management, Range Management, and Biodiversity Conservation. The latter unit will require additional PCU environmental management staff and will include three staff seconded from the Nature Conservation Sector (NCS) of EEAA (partially financed by the project) to work with the PCU for the life of the project. These EEAA/NCS field staff will be responsible for implementing the activities related to protected areas designation and management, including species conservation. community participation in biodiversity conservation, and training in protected areas management. Vehicles and equipment also will be provided in order to support the implementation of the new activities related to biodiversity conservation under the project.

In addition, the MRMP II will provide the Matruh Governorate's EMU with two part-time environmental experts, i.e., an environmental screening/impact assessment expert and an environmental monitoring expert, for the five-year life of the project. These experts

will work closely with EMU environmental staff, Matruh Governorate officials (particularly in land-use planning and coastal development) and project staff to provide training in environmental screening and impact assessment, integrated environmental and resource management planning, and environmental monitoring and evaluation. They will train trainers and assist with course compilation of training material for the project. As needed by the Matruh Governorate, these experts will also perform duties outside the project to ensure the implementation of an integrated ecosystem approach to the region, regarding development and compliance with environmental laws in urban areas and in coastal tourism centres.

IV. ENVIRONMENTAL MONITORING PROGRAM

Although the MRMP I established a Monitoring and Evaluation Unit (M&E Unit) to perform regular monitoring and evaluation of project activities, the M&E Unit did only limited environmental monitoring. Thus the MRMP II will have to build capacity within the M&E Unit, as well as in the new Natural Resource Management Department, to perform specific environmental monitoring and evaluation functions for the project.

A. MONITORING ENVIRONMENTAL SCREENING AND IMPLEMENTATION OF MITIGATION MEASURES

Just as the M&E Unit will monitor implementation of MRMP II sub-projects, it also will assume responsibility for monitoring compliance with environmental screening requirements and implementation of any mitigation measures for sub-projects required, either by EEAA or the Matruh EMU, as a result of environmental screening. Furthermore, the M&E Unit will periodically monitor specified indicators of environmental impacts of the MRMP II (e.g., drinking water quality, incidence of water-borne diseases, terrestrial biodiversity, rangeland regenerative capacity). This environmental monitoring will be incorporated into the overall MRMP II monitoring plan required as part of project performance by the World Bank. The results of such monitoring will be recorded and reported in the PCU's bi-annual progress reports to the Bank and will be reviewed by Bank supervision missions. In the context of the GEF program, the M&E Unit will develop a specific monitoring program, with verifiable indicators (e.g., changes from baseline conditions in diversity of flora and fauna, area devoted to community conservation efforts, area devoted to cultivation of medicinal herbs), to monitor and evaluate progress in achieving and sustaining expected global environmental benefits. A set of performance indicators for the implementation of the EMP has been included in the Environmental Guidelines Manual (Table 5).

B. MONITORING ENVIRONMENTAL DATA

Where the Natural Resource Management Department, through its technical units, undertakes specialised studies, surveys or research efforts, it will assume responsibility for monitoring the results and evaluating the impacts. For example, under the GEF component, the Biodiversity Conservation Unit will test the regenerative capacity of rangeland plants under various management regimes in order to assist in estimating the carrying capacity of the rangelands. Environmental monitoring of this sort will be used to evaluate and support the biodiversity conservation and integrated ecosystem management approaches promoted by the project. A set of monitoring indicators for the biodiversity and ecosystem has been included in the Environmental Guidelines Manual (Table 4).

V. IMPLEMENTATION PLAN

A. INSTITUTIONAL ARRANGEMENTS FOR IMPLEMENTATION

Implementation of the EMP will be shared among the PCU, EEAA, and the Matruh EMU. The PCU has overall responsibility for implementation of the MRMP II and will ensure that the EMP is fully integrated into implementation of the project. The PCU will ensure that sub-projects with potential adverse environmental impacts undergo environmental screening and monitor their implementation of required mitigation measures. The PCU will also work closely with the EEAA/NCS staff seconded to the PCU in carrying out their training programs and other activities related to biodiversity conservation and protected area management.

The EEAA/NCS staff seconded to the PCU will be responsible for implementation of the activities related to protected areas management and biodiversity conservation and will work closely with the PCU in carrying out these activities. The EEAA/NCS will also manage the national and international consultants contracted to provide training to the PCU, EEAA/NCS field staff, and EMU staff on integrated ecosystem management issues.

The Matruh EMU will ensure that MRMP II sub-projects directed to it for review are screened and approved in a timely manner under the EEAA EIA Guidelines. The EMU will also manage the environmental experts contracted to support it in its environmental responsibilities and ensure that they co-ordinate closely with the PCU and the EEAA/NCS field staff.

B. PROPOSED IMPLEMENTATION SCHEDULE

Implementation of this EMP will begin with review and refinement of the Environmental Guidelines Manual in the first quarter after project effectiveness. The PCU then will undertake implementation of the main mitigation measures recommended and begin the screening process for sub-projects, continuing these activities throughout the life of the project.

Training programs will take place throughout the life of the project, on the basis of identified needs, with scheduled training for PCU and EMU staff occurring early in project implementation, followed by training programs in the local communities. Such training would be revisited, updated, and delivered on an annual basis, as needed. EEAA/NCS staff will be seconded full-time to the PCU for the life of the project, while the environmental experts financed for the EMU will be part-time for the life of the project.

The monitoring program for environmental screening will run continuously for the life of the project, while periodic monitoring will be used to evaluate the impacts of mitigation measures and track baseline environmental conditions in the project area.

The proposed schedule for implementing the various components of the EMP is shown in Table 1.

Table 1: EMP Implementation Schedule

Major EMP Activities	1st Q '03	2nd Q '03	3rd Q '03	4th Q '03	1st Q '04	2nd Q '04	3rd Q '04	4th Q '04	1st Q '05	2nd Q '05	3rd Q '05	4th Q '05
Environmental Mitigation Measures												
-- Env Guidelines Manual												
-- Main Mitigation Measures												
-- Environmental Screening												
Training and Capacity Program												
-- Environmental Training												
-- PCU management/staff												
-- Matruh EMU												
-- Communities												
-- EEAA/NCS seconded staff												
-- EMU environment experts												
Environmental Monitoring Program												
-- Environmental Screening												
-- Mitigation Measure Impacts												
-- Baseline Changes												

C. ESTIMATED IMPLEMENTATION COSTS

The estimated costs of implementing the various components of this EMP are displayed in Table 2. These costs are included in the total costs of the MRMP II and are financed with funds from the World Bank/IFAD loan or from the GEF grant. No additional costs are envisaged as a result of the EMP.

Table 2: Estimated Costs per EMP Component

EMP Activity (MRMP II Component)	Quantity	Unit Rate US$	Costs in US$			Source
			Local	Foreign	Total	
Consultants & Training (national/ international)						
- community capacity building (A)	12 MM	300/MM	50,000	53,600	103,600	WB/IFAD
- watershed/rangeland management (B)						WB/IFAD
- biodiversity conservation (B)						GEF
EEAA/NCS staff (3 nat) seconded to PCU for 5 years (B)	180 MM	850/MM	153,000	0	153,000	GEF
Environmental experts (2 national) for Matruh EMU for 5 years (part-time) (B)	60 MM	2,000/MM	120,000	0	120,000	GEF
Vehicles (B)	2	20.000		40,000	40,000	GEF
Office equipment (computers, printers, etc.) (B)	Lump sum	20,000		20,000	20,000	GEF
TOTAL			TBD	TBD	TBD	

June 12, 2002 11 59 AM