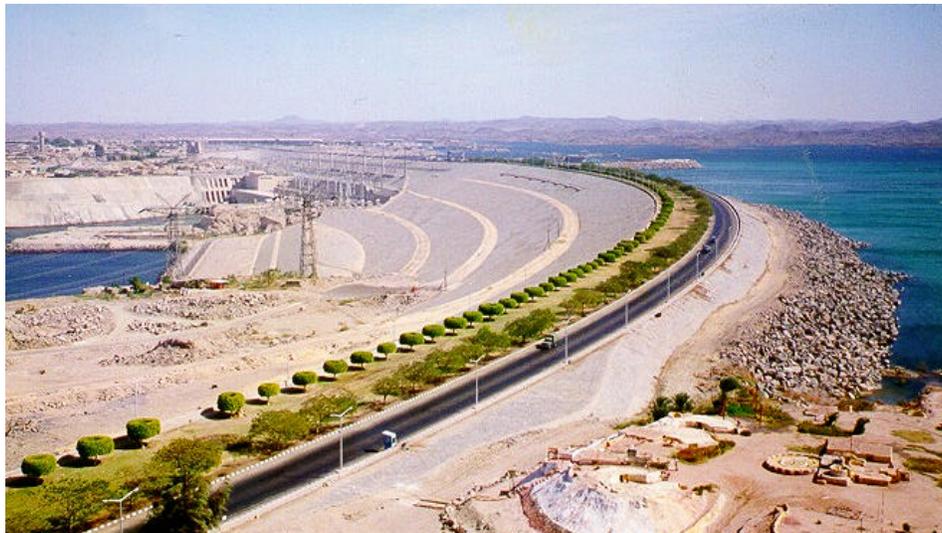


**Ministry of Water Resources and Irrigation
US Agency for International Development
Agricultural Policy Reform Program
Environmental Policy and Institutional Strengthening Indefinite Quantity Contract**

**APRP—Water Policy Activity
Contract PCE-1-00-96-00002-00
Task Order 807**



ENVIRONMENTAL MANAGEMENT AT MWRI

Report No. 51
Main Document

December 2001

Water Policy Program

International Resources Group

Winrock International

Nile Consultants

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ENVIRONMENTAL MANAGEMENT AT MWRI

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Acronyms and Abbreviations

APRP	Agricultural Policy Reform Program
CAA	Competent Administrative Authority
CEDARE	Center for Environment and Development for the Arab Region and Europe
CEIAU	Central Environmental Impact Assessment Unit
DRI	Drainage Research Institute
ECRI	Environment and Climactic Research Institute
EEAA	Egyptian Environmental Affairs Agency
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPADP	Egyptian Public Agency for Drainage Projects
EPIQ	Environmental Policy and Institutional Strengthening Indefinite Quantities Contract
GOE	Government of Egypt
HRI	Hydraulic Research Institute
IRG	International Resources Group
MALR	Ministry of Agriculture and Land Reclamation
MOHP	Ministry of Health and Population
MWRI	Ministry of Water Resources and Irrigation
NOPWASD	National Organization for Potable Water and Sanitary Drainage
NRI	National Research Institute
RIGW	Research Institute for Groundwater
SRU	Strategic Research Institute
UNICED	United Nations Conference on Environmental and Development
USAID	United States Agency for International Development
USEPA	United States Environmental Protection Agency
USGS	United States Geologic Survey
WPAU	Water Policy Advisory Unit
WPRP	Water Policy Reform Project

Executive Summary

Background

Over the past two decades the environmental impacts associated with growth and development have begun to be integrated into national resource management decision-making in Egypt. Today, achieving long-term sustainability in developing Egypt's natural resource base has become a driving force behind recent development planning efforts. In realizing sustainability in development, it becomes imperative that economic strategies be ever more compatible with long-range environmental planning. Nowhere is this more important than in the development of Egypt's limited freshwater resources.

As the lead GOE institution chartered with management of Egypt's water resources, the MWRI seeks to expand its project assessment capabilities by broadly incorporating the environmental impact assessment process (EIA) into critical aspects of its planning activities and decision making.

Environmental Impact Assessment

The Environmental Impact Assessment (EIA) is an institutional process created to integrate environmental considerations and stakeholder involvement into development decision-making. The EIA process has five main features that make it unique and effective. These include: identifying project alternatives, screening for possible negative impacts, identifying and recommending appropriate mitigation measures, gaining beneficiary consensus through public participation, and establishing monitoring and evaluation.

The process of fulfilling EIA requirements ensures that environmental issues are raised when a project or plan is first proposed and that all concerns are addressed as a project gains momentum through to implementation.

Need for EIA in MWRI

Presently, the Ministry possesses limited but critically needed technical and institutional capabilities and experience in conducting EIAs. In the near future, it is anticipated that MWRI will gain the capability to conduct EIAs on all future water resources projects, either directly as the project developer, or as the licensing Competent Administrative Authority (CAA).

Benchmark Statement and Verification Indicator

In response to this need, APRP Tranche V Benchmark C.3, “Environmental Management at MWRI,” was undertaken to develop and formalize the EIA process within the MWRI institutional framework. Specifically, the benchmark states:

The GOE (MWRI) will approve a policy to improve environmental management of water resources in MWRI operations.

The verification indicator for this benchmark is:

An approved MWRI policy that addresses procedures, mechanisms, and a plan to assure environmental concerns are addressed in the MWRI activities, by requiring that environmental impact assessments be conducted for proposed new projects.

Benchmark Activities

Activities undertaken through the course of the benchmark are intended to lead to the development of a policy statement requiring EIA application to all future water resources projects in Egypt, and expanding the ministry’s capability to implement the resulting policy. Benchmark activities included maintaining a high level of inter-ministerial cooperation, conducting stakeholder awareness workshops, a study tour to investigate the EIA process in the United States, reviewing and assessing present

MWRI capabilities and resources, and compiling a guide for applying EIA to future water resources projects in Egypt.

Benchmark Achievements

Achievements resulting from the aforementioned benchmark activities include an assessment of MWRI's existing resources and potential for conducting environmental assessments, a plan to adapt the EIA process to fit within the existing MWRI institutional framework, an EIA Source book to serve as a guideline for conducting EIAs within MWRI, a policy statement, and a mechanism and proposed implementation plan to fully establish the required level of institutional capacity within MWRI, mandating EIAs for all proposed water resources projects.

Policy Statement

A recommended policy statement was developed with input and modification from the involved GOE stakeholders. This was submitted to H.E. the Minister, who put it into force by means of his signature. Copies of the signed policy, in English and in Arabic, follow this page.

1 Introduction

1.1 Overview

The Agricultural Policy Reform Program (APRP) is a five-year, United States Agency for International Development (USAID) grant program involving several ministries. The Ministry of Water Resources and Irrigation (MWRI) is the lead Egyptian governmental agency charged with the management of water resources. The MWRI and USAID, under the umbrella of the APRP, jointly designed a water policy package consisting of integrated water policy and institutional reforms. USAID supports the Ministry's policy reform efforts by providing technical assistance and annual cash transfers based on performance in achieving identified and agreed-upon policy reform benchmarks.

Coordination among MWRI, USAID, and the water policy technical assistance program is through the Water Policy Advisory Unit (WPAU) and a project steering committee established by the MWRI. Technical assistance for the water policy analysis activity is provided through a water resources results package task order (Contract PCE-I-00-96-00002-00, Task Order 807) under the Environmental Policy and Institutional Strengthening Indefinite Quantity Contract (EPIQ) between USAID and a consortium headed by the International Resources Group (IRG) and Winrock International. Local technical assistance and administrative support is provided through a subcontract with Nile Consultants.

1.2 Purpose of the Report

A Memorandum of Understanding between the Arab Republic of Egypt and USAID, dated 15 July 2001, listed the mutually agreed policy reform benchmarks for APRP Tranche V (1 January 2001- 31 December 2001). The purpose of this report is to document the activities carried out by MWRI in support of the successful completion of the APRP Tranche V, Benchmark C.3 Environmental Management at MWRI.

1.3 Organization of the Report

This final benchmark report consists of five chapters in addition to three appendices. Chapter 1 is an introduction, providing an overview of the APRP, an explanation of the purpose of the report, and a description of the report contents and a justification of the need for EIAs in MWRI. A background, explaining the significance of considering environmental impact, a brief history of the EIA process, a description of the report contents, and the future vision of EIA within MWRI, is presented in Chapter 2. The T5 C.3 benchmark program, including benchmark statement, verification indicator, policy objective, anticipated long-term results, and project activities is given in Chapter 3. Results of benchmark activities addressing EIA as a process, a discussion of the EIA Source book developed under the benchmark, and institutional requirements required for implementation of EIA, are presented in Chapter 4. Chapter 5 addresses recommended policies to improve environmental management of water resources in MWRI operations, explains the organizational structure for the implementation of EIA in MWRI and the proposed implementation plan for further expanding the EIA system within the ministry.

Included in a separate bound volume, as documentation supporting this final benchmark report, are three appendices:

- Appendix A Environmental Impact Assessment Source book;
- Appendix B EIA Stakeholders Workshop Report, and;
- Appendix C United States Environmental Study Tour Report.

1.4 The Need for Environmental Assessment in MWRI

The MWRI does not possess a mechanism to fully consider the broader spectrum of environmental impacts associated with its development projects and thus has not conducted environmental impact assessments on a regular basis. As such, some water resources development projects have suffered from unanticipated negative environmental impacts. To minimize possible negative impacts of future water

resources projects, there exists the need for an effective management tool by which ancillary impacts on environment might be included in the project planning process.

Though there are many examples where such a mechanism would have been of benefit to MWRI in the past, the construction of mixing pump stations in the Nile Delta for drainage water reuse is one clear example. When the plan to construct these central-mixing stations was developed, little consideration was given to the impact that poor water quality would have on the utilization of these investments. As a result of this oversight, many of the Delta mixing stations have not been able to provide their full benefit, and since 1992, seven of the 23 stations in the Delta have been entirely or periodically closed, due to the fact that the quality of drain water was not acceptable for reuse in agriculture. If a mechanism to identify and assess the possible impacts of such projects had been available to decision makers, such outcomes might have been avoided.

Sound water resources development and a quality environment play critical roles in the future of Egypt and the well being of Egyptians. As such, the MWRI must strive to manage the coexistence of these two important planning variables. Accordingly, the Ministry must establish a mechanism for addressing the environmental issues while coordinating its relationship with other concerned stakeholders. To minimize the possibility of such oversights occurring in future projects, the Ministry needs to formally adopt the EIA process into its framework and adapt it appropriately to fit the current Egyptian context.

MWRI has for some time accepted the principal of environmental screening of water resources development projects at the planning stage. Efforts to initiate project screening in the form of impact assessments began nearly ten years ago through the efforts of the international donor community. In recent years, the MWRI has strived to initiate the basis for environmental assessment within its institutional planning framework. Presently, the Ministry possesses limited but growing capability to assess the broader range of impacts associated with some of its activities.

MWRI now seeks to expand its environmental assessment capabilities by fully adopting the EIA process. The Ministry is planning to adopt guidelines to implement environmental impact assessment (EIA) consistently and methodically. As a first step, MWRI will apply EIA to all new projects executed by the Ministry. Ultimately, MWRI aims to fully incorporate the EIA process into the planning, construction, and operation of all its water-related development projects.

2 Background

Economic, social, and environmental change is inherent to development. However, while development aims to bring about positive change, it can sometimes lead to unanticipated negative impacts, such as conflicts among stakeholders and beneficiaries, adverse changes in socio-economic conditions, and/or exploitation of natural resources at the expense of the environment.

In the past, economic growth was promoted as the single catalyst for increased well-being, and thus became the main thrust of development. During this period, little attention was given to adverse social or environmental side effects associated with development projects. In many cases throughout the world, focus on financial gain and economic growth as the sole measure of development has led to unexpected and often serious long-term negative environmental impacts and increased socio-economic imbalance.

Today, it is realized that development entails more than economic expansion. To achieve true development, it is imperative that economic development strategies be compatible with long-range environmental planning. A first step in consummating the marriage of these critical elements requires the incorporation of environmental sensitivity into the development planning process.

This broadened definition of development has led to the concept of developmental sustainability. Sustainable development aims to increase general well being by providing greater opportunity for equity in fulfilling basic human needs, without compromising the environment and future generations. Today, sustainability has become an accepted and essential feature of development.

To facilitate sustainable development goals, management tools have been created which integrate environmental considerations into the development decision-making process. One such management tool is the Environmental Impact Assessment (EIA).

2.1 Environmental Impact Assessment

Developed in the 1970s, environmental impact assessment (EIA) is a process used to identify the broader spectrum of environmental impacts associated with a specific development project. Generally, the EIA process has five main features that make it unique and effective. These include:

1. Identifying project alternatives;
2. Screening for possible negative impacts;
3. Identifying and recommending appropriate mitigation measures;
4. Gaining beneficiary consensus through public participation, and;
5. Establishing monitoring and evaluation.

Through these actions, the EIA process provides a unique opportunity to demonstrate ways in which the environment may be improved through development. The EIA aids in predicting conflicts between proposed projects and environmental priorities, and provides an opportunity for conflict resolution and mitigation to minimize ancillary negative impacts.

Though EIA results in a number of important outputs, it is the process of fulfilling EIA requirements that gives it potency. The EIA process insures that environmental issues are raised when a project or plan is first discussed and that all concerns are addressed as a project gains momentum through to implementation. Most importantly, EIA enables monitoring programs to be established which evaluate project performance and assess future impacts. Monitoring, in turn, provides data by which project managers and development planners can adapt and improve future project activities and mitigation measures. Through use of the EIA process, it becomes possible to make informed choices and implement long-term planning, which in turn support sound development

The United Nations Conference on Environment and Development (UNCED) has made clear the importance of environmental considerations, specifically as they pertain to the impacts associated with water resources development. Agenda 21,

Chapter 18, from the proceedings of this important conference states, “Protection of the quality and supply of freshwater underscored the importance of environmental protection and conservation of the natural resource base in the context of water resources development for agriculture and development.”

Within the Government of the Arab Republic of Egypt during the past two decades, the importance of environmental protection and conservation measures in development planning and practice has been recognized.

An arid desert country, Egypt’s most important and limited natural recourse is undoubtedly fresh water. Major freshwater resources in Egypt presently include the River Nile, deep groundwater reserves, and to a far lesser extent water generated through desalinization of brackish water. As elsewhere, water resources development projects in Egypt can result in many far-reaching ecological and socio-economic changes.

While water resources projects are generally intended to benefit human population, some threaten the environment and in some cases the long-term productivity of the projects themselves. Pollution, soil erosion, desiccation, water-logging, groundwater depletion, displacement of people, loss of habitat and rare and endangered species, climate change, transmission and propagation of disease, and energy consumption are only some of the possible negative impacts associated with water resources development. Appropriately, recent Egyptian environmental law mandates that the EIA Process be applied to all future water resources development projects.

The EIA process makes sure that environmental issues are raised where a project or plan is first discussed and that all concerns are addressed as a project gains momentum through to implementation. Recommendations made by the EIA may necessitate the redesign of some project components, require further studies, and suggest changes which alter the economic viability of the project or cause a delay in project implementation. To be of most benefit, it is essential that an environmental assessment is carried out to determine significant impacts early in the project cycle so that recommendations can be built into the design and cost-benefit analysis without

causing major delays or increased design costs. Recommendations made by the EIA may necessitate the redesign of some project components, require further studies, and suggest changes, which alter the economic viability of the project or cause a delay in project implementation. To be of most benefit, it is essential that an environmental assessment be carried out to determine significant impacts early in the project cycle so that recommendations can be built into the design and cost-benefit analysis, without causing major delays or increased design costs.

EIA as a process can:

- Modify and improve the design of a proposed project;
- Ensure that the resources are used efficiently;
- Enhance the social aspects related to the proposals;
- Mitigate potential adverse impacts;
- Identify measures for monitoring and managing impacts, and;
- Facilitate informed decision-making.

EIA involves gathering and analysis of all relevant information on a proposed project to determine the likely consequences if this proposal is implemented in a given area, and if it should be implemented, what appropriate mitigation or alternatives must be considered in order to ensure environmentally sound and sustainable implementation.

2.2 EIA General Procedure

Usually, the proponent is responsible for carrying out the EIA. The requirements for the EIA may be set out in law, guidelines or other procedures depending upon the stakeholders of the project. Sometimes it may be necessary for the proponent to comply with more than one set of procedures. In this case, the need for good planning is even more important.

EIA is typically carried out by a team of people appointed especially for the task, with an appropriate range of scientific, economic, and social expertise. This group of people acts as an interdisciplinary team, meeting together to plan a systematic process

for carrying out the study. The team leader (often called the EIA project manager) plays a key role in the successful outcome of the process.

Not all projects need an EIA. Different EIA systems use different methods of choosing, or screening projects to decide which will not significantly affect the environment and which will. Some systems designate projects or areas using threshold lists. Others use judgement or initial evaluations to determine environmental significance based on proposal type, size, cost, the sensitivity of the environment to development, or the strength of community opinion.

The exact components, staging and responsibilities for an EIA process will depend upon the requirements of the country or donor. The main stages of the EIA procedure are:

- Screening,
- Scoping,
- Assessing,
- Mitigating,
- Reporting
- Reviewing,
- Decision-making
- Monitoring and Management, and
- Public Involvement.

Screening:

An initial assessment to decide whether a project requires further investigation in an EIA.

Scoping:

To identify the key impacts requiring further investigation, and prepare the terms of reference for the study.

Assessing:

The identification, analysis and evaluation of the significance of impacts.

Mitigation:

Developing measures to prevent, reduce or compensate for impacts or environmental damage.

Reporting:

Presenting the results of the impact assessment in a useful format.

Reviewing:

Assessing the adequacy of the EIA report, taking account of the points of view of stakeholders and assessing the acceptability of the proposal in terms of existing plans, policies and standards.

Decision-making:

Deciding whether the proposal can proceed and under what conditions. The decision-maker has the option to request that the proposal be rejected or redesigned (or certain aspects redesigned) so that adverse environmental impacts are minimized.

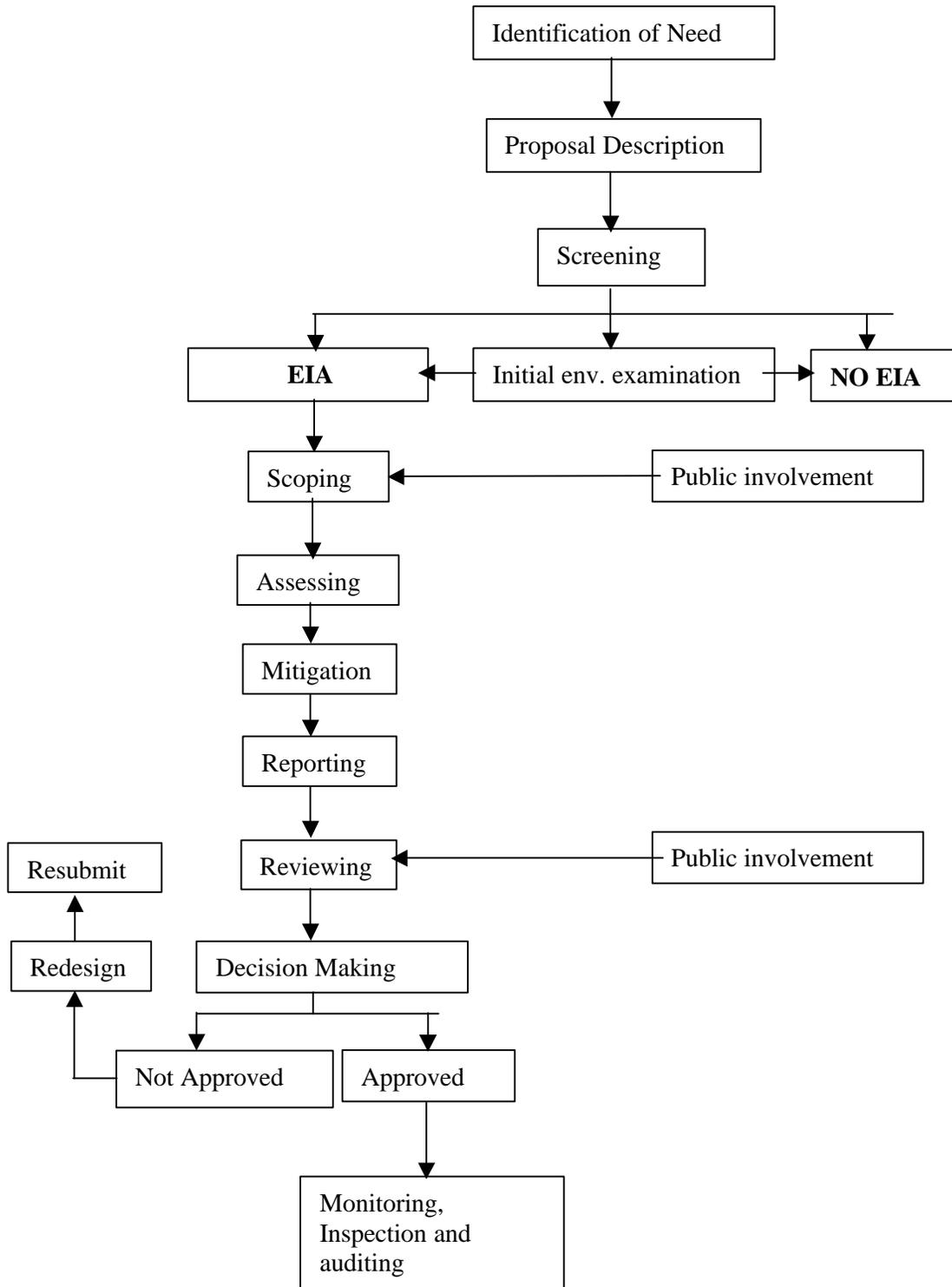
Monitoring and Management:

Implementing mitigation measures, monitoring impacts for compliance, checking that they are as predicted. Taking necessary action to ameliorate problems if they appear.

Public Involvement:

Public involvement takes place typically during the scoping and reviewing phases of EIA, but may also occur at any of the other stages of the EIA process. Public involvement programs can range in purpose from those that aim only to provide the public with information, through to those that encourage the full involvement of the public in the decision-making process. Public involvement must be carried out in a manner that is appropriate to the culture of the people concerned. A flow chart of the EIA Process is presented as Figure 2.1.

Figure 2.1 Flow Chart of EIA Process



2.3 MWRI Responsibilities Related to EIA

The Egyptian Government has enacted several important environmental laws and ministerial decrees in an effort to incorporate the environmental dimension into its institutional planning and decision-making framework. Among these laws is Law 4/94, which defines the roles and responsibilities of government as it relates to the environmental impacts associated with development. Law 4/94 is complemented by executive regulations issued by the Prime Minister as decree No. 338 of 1995.

Law 4/94, concerning protection of the environment, was created to address pollution measures and controls for existing, as well as new and/or expanded developments and projects. Under Law 4/94, new projects will require an EIA. Articles 19 through 23 and 70 through 73 of law 4/94 stipulate measures related to the required EIA. This precedent-setting law defines the Egyptian Environmental Affairs Agency (EEAA) as the national institution mandated to oversee and implement Law 4/94.

EEAA was established in 1982 as the public entity affiliated with the competent Minister for Environmental Affairs. EEAA is chartered with the responsibility and authority to formulate national environmental policy as well as to prepare the necessary plans for the protection, promotion and enforcement of environmental laws, including Law 4/94.

In 1994, discussions between EEAA and the line ministries were conducted, detailing each entity's respective role and responsibility in carrying out the EIA process. In 1996, EEAA formalized the responsibilities of line ministries based upon agreements resulting from these discussions. The remainder of this chapter focuses on the roles and responsibilities of the MWRI in implementing the EIA process.

2.4 MWRI Present Situation Related to EIA

Activities discussed in this section were the result of work conducted under the APRP T5 C.3 benchmark, principally a survey of environmental units, human resources and

previous EIA studies conducted by MWRI. While the discussion is by no means exhaustive, it provides the reader with a general sense of MWRI's present responsibility, capability, and future potential to carry out its role in the EIA process and establishes a starting point for further EIA development within the Ministry.

Law 4/94 states that a Competent Administrative Authority (CAA), or licensing authority, must evaluate and approve all EIAs before project construction works can be initiated

The MWRI is somewhat unique with respect to the accepted EIA process in that it serves both as a licensing agent to approve projects constructed by other CAAs as well as a developer for projects planned and implemented internally. As such, the Ministry plays two roles within the current EIA system.

MWRI as a Developer

The Ministry acts as the proponent and developer for many water resources-related projects. As the developer, the MWRI initiates projects according to national need and then carries out the planning and implementation of approved projects. Under these circumstances, the Ministry is responsible for preparing and submitting an EIA to EEAA following the respective national procedures. An example of a project in which MWRI served as the developer is the planning and construction of the Esna Barrage

MWRI as a Competent Administrative Authority (CAA)

Many water resources projects and projects effecting Egypt's water resources are developed by entities other than the MWRI. In this case, the external entity must prepare and submit a detailed EIA to the Ministry. Under these conditions, the MWRI acts as the Competent Administrative Authority. MWRI receives the EIA, submitted by the developer, and then sends it to EEAA for review and comments. The Ministry takes EEAA's comments into consideration when issuing the licenses and acting as the CAA by approving or rejecting the project. Developments around Lake Nasser are examples of projects where the Ministry acts as the CAA.

Environmental Units in the MWRI

As previously mentioned, the concept of environmental impact assessment was introduced to MWRI nearly ten years ago (1992). Today, several environmental assessment units within MWRI departments are in various stages of development. Two environmental units officially established in the MWRI include:

- The Mechanical and Electrical Department in 1998, and;
- The Egyptian Public Authority for Drainage Projects (EPADP) under the Planning and Follow-up Department in 1999.

Human Resources with EIA Background in the MWRI

The survey revealed that some personnel within MWRI have received formal EIA training and acquired various levels of technical expertise, including:

- Four engineers in the Irrigation Improvement Sector who have received short EIA training in the USA or Japan;
- Two engineers from the Reservoirs and Grand Barrages who received EIA training in Germany;
- One person in the strategic Research Unit of the NWRC who has an M.Sc. degree in environment, and;
- Several engineers who have attended short courses in environmental engineering at the MWRI training center.

EIA studies conducted in the MWRI

In general, few EIA studies have been conducted within the Ministry. Among EIA studies conducted by the MWRI, four were reviewed.

The first is an EIA study for the Northern Sinai Agricultural Development Project (El-Salam Canal). This study was funded by the World Bank and carried out in 1992 by Euro Consult in association with Pacer and Darwish Engineers.

The North Sinai Development Agency undertook a second feasibility study including an EIA for the North Sinai Integrated Rural Development Project (Phase II) in 1997.

This study was funded by JICA and was carried out by SANYU Consultants Inc. and Pacific Consultants International.

The third study was an EIA study for the South Egypt Development (Toshka) Project. The study was undertaken by the Center for Environment and Development for the Arab Region and Europe (CEDARE) in 1998. The study followed the EEAA guidelines together with a checklist approach developed by CEDARE.

The fourth and final study examined is a feasibility study for the New Hammadi Barrage and Hydropower Project, including an EIA. Funding for this EIA was provided by the KFW. An environmental group within the Reservoirs and Grand Barrages Sector of MWRI was established to conduct this study. This group was composed of local and foreign experts.

Additional activities related to EIA in the MWRI

Within MWRI, some departments are carrying out EIAs for selected activities, including the:

Mechanical and Electrical Department, where efforts have been undertaken for the assessment of drain conditions and the effects of the low quality water in the drains on pumping stations. World Bank EIA experts conducted this study in 1991.

Drainage Research Institute, which conducted a similar study as those undertaken by The Mechanical and Electrical Department in 1996 for El-Tabia Pumping Station.

Irrigation Improvement Sector has assumed the responsibility for conducting EIA studies for World Bank Projects within the Irrigation Improvement Sector of the Ministry.

EPADP, where two reports were published in 1999 and 2001 on Environmental Assessment Issues by a local consultant. Additionally, a local consultant is currently aiding in EIA studies for select drainage water pumping stations in the middle and northern Delta Region.

High Aswan Dam Authority, where an Inter-Ministerial Committee was formed for environmental management of Lake Nasser, resulting in a booklet containing guidelines regarding lake water utilization. This committee includes representatives of the Ministries of Water Resources and Irrigation, Agriculture and Land Reclamation, Tourism, Health, Transportation, Environment and Community Development

Several Nile Water Research Center Institutes have also become involved in the EIA Process and the development of related environmental management tools.

- The Drainage Research Institute (DRI) has conducted several studies of water quality monitoring throughout Egypt. Further, the DRI participated in the development and operation of water quality software (SIWARE).
- The Environmental and Climatic Research Institute (ECRI), established in 1994, is keeping a low profile but is working on some EIA studies related to its activities.
- The Research Institute for Groundwater (RIGW) has conducted several studies regarding groundwater pollution and seawater intrusion. Further, the institute is responsible for a network of piezometers for water level and quality monitoring, of some of Egypt's more important groundwater aquifers.
- The Strategic Research Unit (SRU) has participated in a Canadian and an Italian funded project for establishing a decision-support system based on environmental balance.
- The Nile Research Institute (NRI) conducted a Canadian funded project for integrated Nile development in the early 90's.
- The Hydraulic Research Institute (HRI) conducts a wide range of hydraulic studies, which can provide support for any EIA study requiring such expertise.

MWRI's Future Potential to Conduct EIAs

The assessment of the MWRI past and present EIA studies and resources revealed that while present resources are limited, there exists a need in the MWRI to expand its capabilities in the future to conduct EIAs for many more of its water resources development activities.

The multidisciplinary structure of the Ministry is perhaps its greatest asset with regard to EIA potential. The MWRI is composed of institutes and departments, each specializing in a specific aspects of water resources management. Since the EIA is a multidisciplinary or interdisciplinary exercise, an EIA for water resources projects will require the expertise of several disciplines of physical, social, biological, and financial sciences. Given the diverse institutional specialization of the ministry as a whole, experts from the different institutes can contribute to a successful EIA. Further, the NWRC has a number of laboratories, computer software and hardware, field equipment, etc., covering the different aspects of water resources assessment and management to support EIA efforts. Lastly, a wealth of national water quality data exists in the different institutes.

A mechanism has to be established to channel the individual efforts of the institutes into interdisciplinary teams, properly balanced and adjusted for the specific study. Capacity building will be necessary in some aspects. Some external expertise might also be required, for example for social, economic or biological studies. Another important area of required improvement is efficient sharing of data and information among different agencies of the MWRI as well as between the MWRI and other stakeholders with relation to Egypt's water resources. In brief, while MWRI's present EIA capabilities appear limited, great potential exists for it to quickly assimilate and implement the EIA process broadly and effectively.

2.5 MWRI Future Vision

Within the past two decades, the ancillary impacts associated with growth and development have begun to be considered in national resource management decision-making in Egypt. As the lead GOE institution chartered with management of Egypt's water resources, the MWRI seeks to incorporate the environmental dimension into critical aspects of its planning activities and projects. To date, the EIA concept has been modestly and inconsistently applied to a limited number of MWRI projects.

In response to this situation, the present benchmark of the APRP was designed to develop and formalize the EIA process within the MWRI institutional framework. It is the goal of this important benchmark to develop a policy that will insure that the EIA process is effectively implanted and methodically applied to all MWRI project-planning activities. One specific goal of the benchmark is to identify recommended procedures and mechanisms required for MWRI to establish a dedicated, well-trained, and interdisciplinary environmental unit. This proposed environmental unit will exist within the Ministry and will interface with the EEAA, which is empowered to oversee the EIA process through Egyptian Environmental Law 4/94.

In the future, it is anticipated that MWRI projects will be screened and categorized as projects with no foreseeable impacts, or Type A projects (*white projects*); projects with potential impacts, or Type B projects (*gray projects*); and projects with unquestionable impacts, or Type C projects (*black projects*). The EIA process will be applied to all MWRI project activities to the recommended level of detail based upon the project category. The MWRI will coordinate and oversee adequate mitigation and monitor follow-up activities to ensure that the recommendations of each project-specific EIA study are implemented. In this manner, the MWRI will improve its water resources management to better serve the Arab Republic of Egypt and its people.

3 Benchmark Program

The Government of Egypt recognizes the need to institutionalize the environmental dimension into its development planning process. As such, it has enacted laws to establish the EIA process at the national level. Through the diligence of the EEAA, the roles and responsibilities for carrying out environmental impact assessments have been defined for all responsible GOE line ministries. The GOE Ministry responsible for national water resources development is the MWRI. Through the APRP Tranche V C.3 Benchmark, the GOE intends to formalize the EIA Process within the MWRI.

3.1 Benchmark Statement

Accordingly, the T5 C.3 Benchmark states that:

The GOE (MWRI) will approve a policy to improve environmental management of water resources in MWRI operations.

3.2 Verification Indicator

The indicator established to confirm completion of this benchmark is as follows:

An approved MWRI policy that addresses procedures, mechanisms, and a plan to assure environmental concerns are addressed in MWRI activities, by requiring that environmental impact assessment be conducted for proposed new projects.

3.3 Policy Objectives

The approved environmental policy is intended to achieve the following objectives:

1. Provide guidelines which address the broader range of environmental concerns affecting Egypt's water resources development and management.

2. Preserve Egypt's environment and water resources base while simultaneously creating a more productive economy and healthier environment for the benefit of all Egyptians.
3. Foster sustainable development of new projects in the national water sector.

3.4 Anticipated Long-term Effects

Expected effects of this benchmark include, but are not limited to:

- Enforcement of Law 4 of 1994 and its Executive Regulation;
- Identification of mechanisms and procedures for ensuring that environmental matters are properly addressed in MWRI water resources planning, operation, and management activities;
- Establishment of specific channels for coordination between MWRI and other agencies responsible for environmental matters;
- Creation of a dedicated central multidisciplinary environmental unit to conduct MWRI EIA work;
- Increased awareness of the importance of integrating environmental parameters, where appropriate, into all Ministry water management activities by the Ministry staff, at all levels.

3.5 Benchmark Activities

This section provides a brief description of the critical activities conducted under the APRP T5 C.3 benchmark.

Activities carried out by WPAU/EPIQ and MWRI in support of this benchmark included:

- Fostering Inter-ministerial cooperation and collaboration;
- Investigating the present EIA practices and capabilities in MWRI to clarify their operating procedures, mechanisms and effectiveness;

- Conducting a study tour to the USA to learn EIA history and practices in the US water sector;
- Sponsoring and conducting a discussion workshop for MWRI and other stakeholders to discuss and revise the MWRI EIA Guidelines;
- Sponsoring and conducting an awareness workshop for middle management staff of MWRI, and;
- Preparing an EIA Source book that tailors general EIA requirements to particular water activities undertaken by MWRI. This source book is intended to be a reference guide for MWRI staff in the future.

Inter-ministerial Co-operation and Collaboration

The EIA process requires the participation of numerous stakeholders, including government institutions and agencies, the private sector, and the general public. As such, developing and implementing the EIA under the APRP Tranche V C.3 benchmark included the participation of several ministries and agencies. The Benchmark Working Group was led by Eng. Nasser Ezzat (WPAU) and included members from the EPIQ Team, MWRI, EEAA, and two private consulting companies that deal with EIA preparations for a variety of interests. Additionally, the following ministries were invited to the Environmental Management Stakeholders workshop: MWRI, MALR, EEAA, NOPWASD, and MOHP.

MWRI Capabilities and Resources

In the early stages of the EIA benchmark activity a survey of existing environmental units, human resources, and previous EIA Studies conducted by the MWRI was performed. The purpose of this survey was to assess MWRI's present capabilities and potential to conduct EIA work in the future.

EIA Source book

An EIA Source book was written and prepared to serve as a guide for applying the EIA Process within the Egyptian Institutional framework. This guidebook is intended to serve as a reference baseline for application of the EIA process within the Egyptian context. The source book is presented in its entirety in Appendix A.

EIA Awareness Workshop

An Awareness workshop was conducted on August 16 and 17, 2001, for middle management of the MWRI. The focus of this two-day affair was to present a discussion of the EIA process in general, Egyptian environmental regulations, MWRI environmental experience and capabilities, and the ongoing benchmark objectives and activities. An opportunity was provided for participants to discuss the presentations in detail and to provide feedback to the working group. The presentations resulted in lively discussion and the objective of increasing environmental awareness among MWRI staff was achieved.

Study Tour

The United States has successfully developed and implemented EIA as a process over a 30-year period. There is much to be learned from the experience of other countries, specifically the United States, regarding the EIA process and its application. As such, MWRI organized a study tour to the United States from July 15-30, 2001, to help participants learn more about EIA as a part of the APRP Water Policy Benchmark C.3, relating to environmental management. The objectives of the study tour were to learn:

- EIA history in the US water sector;
- EIA practices in the USEPA, USGS, and World Bank;
- EIA practices in the California water sector;
- Environmental dimensions of California water resources management;
- Reference water EIA Guidelines;
- Reference water EIA projects, and;
- Society responses to water EIA.

A description of the study tour is detailed by the study tour report included as Appendix C.

Stakeholder Workshop

An Environmental Management Stakeholder Workshop was conducted on October 17 through 19, 2001 in Ras Sidr. During this workshop a draft EIS policy and timeline

was presented to the participants. Representatives from MWRI, EEAA, NOPWASD, WPAU, EPIQ, and Chemonics Egypt attended this workshop. The main objectives of the stakeholders' workshop were to:

- Exchange knowledge and experience regarding Environmental Impact Assessment for MWRI activities;
- Seek consensus on the importance of public participation;
- Present and discuss major contents of the MWRI EIA source book;
- Recommend strengthening institutional setup (unit, staff, funding) procedures and mechanisms to support the EIA Process in MWRI, including a plan to implement such policy, and;
- Discuss relations between MWRI and EEAA.

A detailed discussion of the subject matter presented during this workshop can be found in the workshop minutes, included as Appendix B.

Policy Statement and Implementation Plan

A recommended policy statement and implementation plan for the EIA process within the MWRI was developed from the draft statement, with input and modification from the involved GOE stakeholders. A plan and timeline for establishing an environmental unit and implementing the EIA process within the MWRI was developed. This plan includes training and financing an environmental unit within the ministry and providing the physical resources necessary to accommodate this unit. This draft implementation plan and timeline was presented during a stakeholder workshop for discussion, modification, and approval by the benchmark working group.

4 Benchmark Achievements

Activities carried out under the T5 C.3 Benchmark resulted in several important achievements, including:

- Identifying resources necessary to implement EIA in MWRI;
- Preparing an EIA Source book that tailors general EIA requirements to particular water activities undertaken by MWRI, and;
- Developing and proposing a policy to improve environmental management and an implementation plan to expand EIA within MWRI.

4.1 Resource Requirements for EIA Development in MWRI

Establishing and implementing the EIA process within the MWRI will require allocation and commitment of physical, financial, and institutional resources.

Physical Resources

Physical resources are relatively easy to identify and may be acquired through conventional procurement methods. Required physical resources will certainly include, but may not be limited to, office space, office supply equipment (computers/software and other office machinery and furniture), environmental monitoring and sampling equipment, vehicles, and adequate operating budget.

Human Resources

While MWRI presently has a small cadre trained in the EIA process; additional staff will be required. As stated previously, execution of the EIA process requires a multi-disciplinary team. The required staff can be formed by training existing staff, hiring new staff, and/or using outside consultants. The disciplines that are lacking at present are in the areas of plant and animal biology, air quality, public health, and anthropology. The working groups concluded that it is not feasible for MWRI to have all the required human resources on staff and recommends using outside consultants and other GOE entities for highly specialized areas of EIA.

Financial Resources

Commitment of financial resources will be required to establish and maintain EIA capability and implement the EIA process within MWRI.

Capital to establish EIA capacity within the Ministry can be provided through GOE sources and through international donor involvement. In the past, the GOE has provided financial support of related environmental assessment activities. The World Bank is presently supporting EIA development within the GOE, and other donor groups have identified interest in providing future support in maintaining environmental units within the Ministry.

Costs of preparing EIA documents can be significant. In cases where the Ministry is acting as the developer of a project, these costs should be included with the project budget itself as a dedicated line item. In cases where the Ministry is acting as the responsible licensing authority, the cost of conducting environmental impact assessment and obtaining the appropriate permissions from the Ministry is the responsibility of the developer.

Institutional Resources

Institutional resources will be required to establish and maintain EIA capability and implement the EIA process. Within MWRI, institutional resources include but may not be limited to training, capacity building, and leadership. Presently, only a handful of MWRI personnel have undergone formal environmental impact assessment training. Additional training will be required to establish technically competent environmental units within MWRI. As the proposed EIA implementing body will be new to the Ministry, capacity building will be required to empower the fledgling environmental unit. Capacity building will require strategic placement of the unit and support from within as well as outside the Ministry. Lastly, strong leadership is necessary to establish and maintain operating protocol and procedures, and to maintain the intended direction and focus of the implementing body.

Institutional requirements necessary to implement the EIA process effectively within MWRI include:

- Political commitment;
- Institutional development;
- Institutional structure;
- Technical capacity, and;
- Administrative and legal framework.

These resources form the resource base required to institute and implement the EIA process within MWRI.

Political Commitment

Political commitment is simply the will of MWRI to institute the EIA process.

Political commitment is required of top management within MWRI in support of the EIA process and is perhaps the most critical requirement for successful integration of EIA into the ministry, since, to use an old expression, “where there is a will there is a way.” Without the political commitment of MWRI, there is almost no chance that the process will be effectively implemented in the future.

The organization wishing to introduce the EIA procedure within its system must therefore be committed to this act and willing to provide all the financial and technical support required to achieve this goal.

Institutional Development

A clear mission or objective is necessary before the EIA process can be effectively established with MWRI. Institutional development of the EIA process is required to establish, formalize, fortify, and define the EIA process within the institutional framework of the MWRI, and to define institutional boundaries and appropriate inter-ministerial and intra-ministerial protocol through which the EIA process can operate. The organization should have the facilities, technical background and suitable manpower to implement the proposed system effectively.

Institutional Structure

Organizational structure is required to define the formal relationship among staff members and to specify their roles and responsibilities both to the EIA process and to MWRI. Administrative systems must be developed to govern the EIA work through policies, procedures, and guidelines. These systems should be consolidated in the form of a written procedure manual. An entity or group of entities will be responsible for the implementation of the EIA system within the organization. A mechanism should be established to coordinate work among the responsible entities.

Technical Capacity

The MWRI is one of the largest ministries in Egypt. It has 23 sectors and departments. The Ministry also houses the National Water Research Center, which consists of 12 institutes carrying out research in a variety of water resources-related fields. Moreover, there are two environmental units: one in the Mechanical and Electric Department and the other in the Egyptian Public Authority for Drainage Projects (EPADP). These institutes and the environmental unit have great potential for future participation in the EIA system. However, they need capacity building in the field of EIA preparation and management.

Also, the Ministry needs to identify which projects require EIAs. The MWRI projects were classified according to the guidelines prepared by EEAA to identify the ones requiring EIA (EIA Source book, Chapter 4). A technical background providing information about the environmental, and social and health aspects of project types was included in Chapter 5 of the EIA Source book.

Administrative and Legal Framework

An administrative and legal framework is required to provide the necessary institutional operating structure and legal guidance and authority within the Ministry in order to mandate and apply the EIA process effectively and efficiently. This framework must provide:

- The power to enforce EIA recommendations;
- Correct deviations identified through application of the EIA process;

- The flexibility and capability to collaborate and coordinate both within and outside the Ministry, and;
- The technical capacity for EIA review and monitoring.

Law 4/94 on the environment is the only basis that sets the requirements for the preparation of an EIA. There is no legal body or framework responsible for implementation of an EIA system in the MWRI. However, the Ministry of Water Resources and Irrigation has realized the importance of planning for environmentally sound projects and is willing to set up an internal structure or mechanism for implementation of the system.

4.2 EIA Source book for Water Resources Development

An EIA Source book was written and prepared to serve as a guide for applying the EIA Process within the Egyptian Institutional framework. This guidebook is intended to serve as a baseline reference for application of the EIA process within the Egyptian context and was prepared as a support for the environmentally sound policy that will be adopted by MWRI. This source book is to be of general use throughout MWRI and has three main functions:

- To describe the methodology and output of EIAs;
- To provide inter-disciplinary advice related to water resources to those engaged in preparing EIAs, and;
- To enhance institutional capacity for carrying out an EIA.

The Source book presents the different roles and responsibilities of the MWRI in the EIA process as both a developer of projects as well as a Competent Administrative Authority (CAA). The guide presents the basis for preparing EIA studies and establishing environmental units within MWRI. Further, this reference recommends a methodology for grouping MWRI projects and provides lists of typical impacts associated with each of the project groups, and provides basic screening forms for MWRI project groups. Lastly, the EIA Source book recommends an EIA process for projects proposed by MWRI, as well as for projects proposed by external developers,

discusses the importance of identifying potential impacts, developing mitigation measures, and enhancing public involvement in the EIA process. It also describes the actual EIA decision-making process and how this process should be applied to fit into the MWRI's existing institutional framework. A copy of the EIA source book is included as Appendix A to this final report.

4.3 Adapting the EIA Process to MWRI

While the EIA process itself has been previously established, existing conditions within the MWRI require that it be adapted to better fit the present institutional framework of the Ministry.

Efficient implementation of an EIA system requires the presence of a strong institutional setup, in addition to the support of technical expertise. In spite of the fact MWRI staff members have expertise in different disciplines, the EIA know-how is limited. The Ministry also lacks the presence of an institutional framework through which the EIA system can be implemented and efficiently managed.

The diversity of sectors and activities within the Ministry results in a rather complex organizational structure. Moreover, different entities within the Ministry have to take part in the EIA activities, as the system should benefit from the already existing expertise within the Ministry. Accordingly, it is required to study the structure carefully in order to suggest how the EIA would fit in.

The implementation of an effective EIA system, in general, depends on the provision of sufficient political and organizational support to ensure the achievement of environmental management objectives of an institution. It also requires proper mechanisms and procedures to secure the following criteria:

- Consistency
- Standardization
- Quality Control
- Impartial review and decision-making

To fulfill and ensure those criteria, sectors or departments can be responsible for conducting the EIA; however, the process as a whole should be managed by a central body. This body should also take part in some of the activities entailed in the EIA process, as well as integrating the roles played by other entities in the Ministry.

Following are the criteria that must characterize the body responsible for managing the EIA system within the Ministry:

- Clear mandate and provisions
- Political power to implement the EIA among strong sectors
- Power to enforce EIA recommendations/reverse decisions
- Power to correct deviations from set environmental standards
- Flexibility and capability to collaborate and coordinate with sectors/ departments
- Technical capacity for EIA review and monitoring
- Human resources
- Capacity to deal with work load
- Administrative/institutional constraints
- Acceptance of the body within the Ministry
- Involvement in training and capacity building

The activities involved in the EIA process are analyzed regarding the possible roles played by different existing and suggested entities in the Ministry. Stimulating, but downscaling the existing EIA system in Egypt is regarded as the most appropriate methodology to devise and implement a system in the Ministry. Accordingly, the Ministry could benefit from the accumulated experience instead of starting an institutional setup from scratch. Table 4.1 demonstrates the potential roles played by each entity.

Table 4.1 MWRI Roles in the EIA Process as CAA and as Developer

EIA Process Activity	Competent Administrative Authority	Developer
Screening	MWRI	Sector / Department
EIA preparation	Proponent	Sector / Department
EIA Review	MWRI	Central Body & EEAA
Project Implementation	Proponent	Sector / Department
Monitoring	Proponent	Sector / Department
Post Audit	EEAA	Central Body
Quality Assurance/Review	EEAA	Central Body

The Ministry's projects are proposed by individual Sectors and/or Departments according to the national needs. Using the MWRI guidelines, they would be able to easily classify the project according to its EIA requirements (A, B or C).

When EIAs are required, the proposing sector, acting as the developer or proponent, will have to carry it out either internally, in cooperation with other technical institutions/units, or through the use of external consultants.

After the EIA is prepared, it is necessary to review it to make sure that all environmental considerations were fully integrated and that any negative environmental impacts are dealt with properly. Review of EIAs, therefore, should be carried out by another body to avoid bias and ensure impartial review. EIA review will be conducted through a suggested body within the ministry. Where technical expertise is lacking, this proposed review body should obtain the help of an external consultant (university, center, private consultants, etc)

Activities of project monitoring during construction and operation phases and post audits can be carried out by the implementing sector. However, the central body should perform quality control monitoring, which can be carried out during any stage

of the project cycle, again in order to assess environmental performance with feedback to improve the process and manage the system.

The existing environmental units cannot perform all of the above activities at present, as they do not have the necessary resources, experience or mandate.

From the above discussion, it appears that different existing bodies in the ministries can be involved in the EIA process, given sufficient technical and administrative training. Executing sectors/departments play a major natural role according to their technical expertise. However, to ensure the effectiveness of the system in the sense of consistency, quality standards and impartiality/objectivity, it is necessary, as stated earlier, to have a central body managing the system and conducting the review and quality control procedures.

Analysis of the Alternatives for Managing the EIA System

Generally speaking, two alternatives exist for creating an implementing entity for EIA within MWRI. Alternatives considered include:

- Upgrading an existing institution within MWRI, or;
- Establishing a new Central Environmental Impact Assessment Unit (CEIAU) within the Ministry.

Upgrading one of the Ministry's Existing Institutions

In spite of the fact that the Ministry's institutions have the technical capacity needed to prepare EIAs, they lack EIA experience itself. The EIA process is a multi-disciplinary, not a mono-disciplinary process, while all the ministry's institutions are primarily mono-disciplinary. On the other hand, most of the technical expertise needed to prepare the EIAs will be drawn from the Ministry's institutions. Having any one of these institutions manage the system would risk the impartiality of the review. Moreover, none of these institutions have the capacity to undertake the load of all the Ministry's projects, which will result in delaying the EIA review process.

Establishing a CEIAU

Establishing a CEIAU in the Ministry's headquarters would have several advantages over upgrading one of the institutes. These include:

- Facilitating cooperation and collaboration within the Ministry's sectors and departments, and reducing the time needed for the EIA review and discussion;
- Better access to decision makers in the Ministry and consequent involvement in policymaking, allowing for integrating environmental issues into the Ministry's plans;
- Awareness of all the planned projects and ability to have an overall picture of the Ministry's plans, and;
- Technical support for vother institutions within the Ministry, as necessary.

Moreover, formulating a new unit will allow for properly structuring and mandating it to organize, manage and monitor the implementation of EIAs across all sectors/departments of the Ministry. It is also expected to provide a framework to ensure that all EIAs carried out within the Ministry are up to a common standard and that all EIA-based decisions are consistent. Accordingly, the unit should be granted sufficient political support and executive power in order to be able to achieve its mandate properly.

Organizational Niche of CEIAU within the MWRI

During the stakeholders workshop, different options for the proposed unit were discussed, and five alternatives for the location of the unit within MWRI were identified as follows.

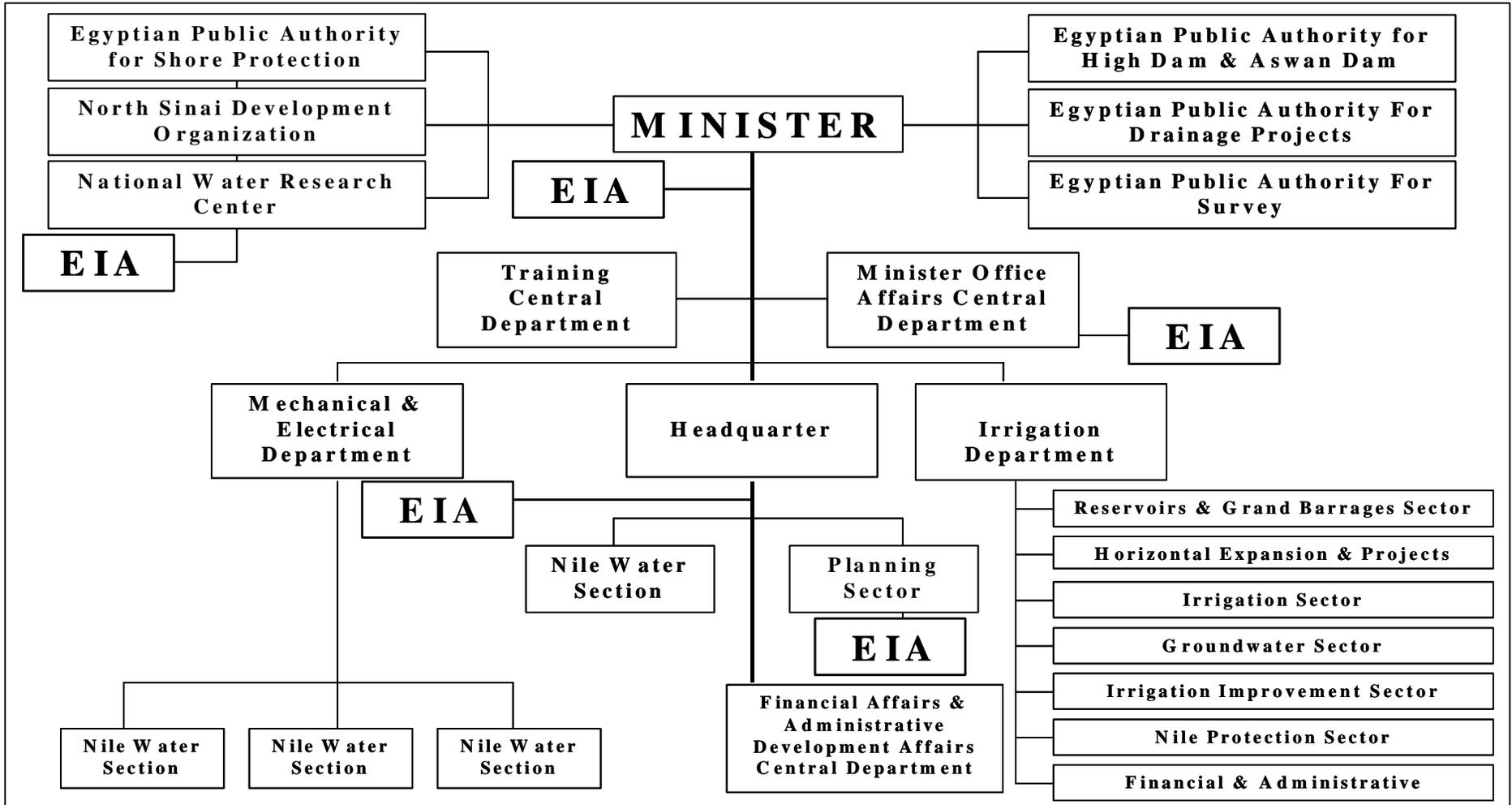
- Directly affiliated to the Minister.
- Directly affiliated to the Minister's office.
- Within headquarter.
- Within the planning sector.
- Within the National Water Research center.

There was consensus among the stakeholders that formulating a new unit will allow for properly structuring the Unit.

The stakeholders also favored affiliating the CEIAU within the Planning Sector.

Figure 4.2, following page, shows the different alternatives for location of the unit within the MWRI organizational chart.

Figure 4.2 Alternatives for Placement of the CEIAU within MWRI



It was also recommended during the stakeholder workshops to establish a top management committee from members of both the MWRI and EEAA for coordination and oversight of MWRI's EIA efforts.

This committee should have periodic meetings to discuss issues of cooperation with regard to the EIA Process and review critical EIAs as required. Most importantly, the committee will be responsible for:

- Adapting MWRI activities according to EEAA regulations;
- Solving problems resulting from conflicts between EEAA regulations and MWRI needs, and;
- Providing final review and approval for critical EIA reports.

4.4 EIA Procedures & Mechanism within MWRI

The working group considered specific procedures and mechanisms to be used to implement EIA within MWRI. The recommended mechanism is described briefly in the remainder of this section.

At the initial stages of the project planning cycle, the proposing sector or department will use the screening lists and other reference materials contained in the Environmental Source book to classify the project as having no impacts (A), minor impacts (B) or major impacts (C). Once the project is classified, the following procedure will be followed.

List A Projects

- The Environmental Screening Form A will be completed by the concerned sector or department and a copy sent to the CEIAU for record keeping;
- The CEIAU will register the documents and check whether the selected category is correct and whether the information submitted complies with the requirements;

- In case the project was misclassified as a List A project, the CEIAU will notify the department of the correct classification and send it back for correction;
- If no comments are received from the CEIAU, the department will proceed with project implementation and notify the CEIAU of project completion.

List B Projects

The procedure consists of two stages: (1) a screening (filling out Form B) possibly followed by (2) a scoped EIA on certain identified impacts/processes.

Filling Form B

- The department or sector will complete the Environmental Screening Form B and send it to the CEIAU for review and record keeping;
- The CEIAU will register the documents and check whether the selected category is correct and whether the information submitted complies with the requirements;
- In case the project was not considered a List B project, the CEIAU will notify the department of the correct classification and send it back for correction;
- If the project was classified correctly, the CEIAU will review the documents (through the use of external reviewers) and submit to the department its opinions and possible proposals for measures to be taken to ensure protection of the environment. This will be done within a stipulated period of time;
- The CEIAU registers the documents, its opinions and proposals in the EIA register;
- The department ensures implementation of the CEIAU decision and registers all information in the environmental register.

When Scoped EIA is requested

- In case the department is requested to conduct a scoped EIA study for selected impacts/processes, the department must submit a completed study to the CEIAU for review and record keeping;
- The CEIAU will register the study and will verify that the information included in the scoped EIA study complies with the required information according to the TOR;
- The CEIAU will review the documents (through the use of external reviewers) and submit to the department its opinions and possible proposals for measures to be taken to ensure protection of the environment. This review will be completed within a stipulated timeframe;
- The CEIAU registers the documents, its opinions and proposals in the EIA register;
- The department ensures implementation of the CEIAU decision and registers all information in the environmental register.

List C Projects

- The department or sector will review the environmental aspects provided for each type of project and the lists of potential impacts and mitigation measures (Annex C) for the group of projects to which it belongs;
- The department will then execute the relevant TOR for EIA preparation. The EIA team could be formed from the experts of the institutions of the MWRI and external expertise could be hired for disciplines that are not present in-house;
- After the EIA study is complete, the department will send it to the CEIAU for review and record keeping;
- The CEIAU will register the documents and confirm whether the selected category is correct and whether the information included in the EIA study complies with the required information according to relevant TOR;

- The CEIAU will evaluate the documents (internally or using external expertise) and submit to the department its opinion and possible proposals for measures to be taken in order to ensure the protection of the environment within a stipulated timeframe of receipt of the completed documents. Failure to do so within this timeframe shall be considered as an approval of the assessment;
- The CEIAU will register the documents, its opinion and proposals in the EIA register;
- The department will ensure implementation of the CEIAU decision and register all information in the environmental register.

Requirements for Initiation of the EIA System

The following steps should be followed to initiate the proposed EIA system within the MWRI:

1. A Ministerial Decree should be issued to the CEIAU stating its mandate.
2. Inside each department or sector, staff members should be designated as being responsible for the preparation of the environmental impact assessment studies and for liaison with the CEIAU. The candidate staff members will require capacity building in EIA.
3. A higher level of capacity building will be required for the staff of the CEIAU.
4. Training and capacity building should be done regularly for the different levels of EIA personnel, to ensure sustainable high performance.
5. Within the project planning stage, a separate budget should be established for the EIA process and a timeframe will be specified for EIA preparation and review.

4.5 Policy and Implementation Plan

A final policy statement and implementation plan for the EIA process within MWRI was developed from the draft statement with input and modification from the involved GOE stakeholders. A plan and timeline was also developed for establishing an

environmental unit and implementing the EIA process within MWRI. This plan includes staffing, training and financing an environmental unit within the Ministry, and providing the physical resources necessary to accommodate this unit. This draft implementation plan and timeline was presented during a stakeholder workshop for discussion, modification, and approval by the joint steering committee. The environmental management policy statement, proposed implementation plan, and timeline are discussed in detail in the following chapter.

5 Recommended Policy

5.1 Policy Statement

The policy statement recommended by the working group is as follows.

In a phased process, a policy to strengthen and integrate the environmental dimension into all activities of the MWRI will be implemented in order to protect human and environmental health and to achieve sustainable management of natural resources while achieving the national development objectives. The procedures, mechanisms and implementation plan proposed in the Agricultural Policy Reform Project's Report No. 51, shall be the basis for executing this policy.

In the future, integration of the environmental dimension should not be limited to new projects of the MWRI, but will be extended to all MWRI policies, plans, and programs.

This policy will be implemented from the 1st of January, 2002.

This draft was transmitted to H.E. the Minister and, after review and consideration, he signed it. A copy of the signed policy is included in the Executive Summary of this report.

5.2 Organizational Structure

The mandate of the CEIAU will be to introduce and integrate the environmental dimension into all MWRI activities in order to provide for the protection of human health and management of natural resources while achieving the Ministry's national development objectives.

Before designing the organization and structure of the CEIAU, the roles and responsibilities of the unit should be highlighted. These include:

- Providing policy and planning frameworks that set contexts for the EIA of projects/activities;
- Providing guidance on types of proposals likely to attract EIAs and on levels of required assessment of each category;
- Setting project-specific guidelines for different types of projects;
- Ensuring compliance of executing sectors with EIA procedures;
- Ensuring implementation of monitoring plans;
- Monitoring, evaluating and upgrading the EIA process to ensure its efficiency and effectiveness;
- Pursuing educational opportunities inherent in the EIA process and upgrading the technical skills of stakeholders, and;
- Interlinking with other environmental bodies in the Ministry.

The organization of the unit is recommended to include two sections. A Quality Control and Post Audit Section would ensure compliance with procedures and guidelines and ensure proper environmental performance. An EIA Review Section would perform an independent review of EIAs prepared within MWRI. Both sections should be supported by a common administrative staff.

The following presents the recommended responsibilities of the unit head and of both sections of the CEIAU.

The Unit Head

The general framework for the responsibilities of the CEIAU head entails planning and coordinating the unit activities. In this respect, the section heads report back to the unit head. The unit head has to be a senior staff member to gain approval among the Authorities and Department heads. He/She would be responsible for:

- Developing the working strategy for the unit, as well as the overall planning of activities, in coordination with the concerned staff members;

- Overseeing the overall proper execution of contracts for services for the different components of the management system;
- Coordinating the activities carried out by the different sections/staff members within the Unit, in order to ensure the smooth overall operation of the Unit;
- Coordinating the activities of the Unit with those carried out by concerned external entities, concerned ministries, etc.;
- Overseeing the response to complaints received related to the day-to-day performance and/or operation of the different system components (complaints from contractors and/or developers would probably be received directly at the Unit. However, public complaints would be received by the MWRI complaints office, which would then transfer them to the Unit);
- Overseeing the proper operation of the different sections, within the mandate and responsibilities of the Unit;
- Overseeing the planning of the inspection activities carried out by the Unit, and coordinating them with those carried out by other concerned bodies, if needs arise;
- Determining, with the concerned staff members, the need for training and capacity building within the Unit, and developing the necessary plans, and;
- Overseeing the identification of needs for overall future expansion of the Unit, and/or extensions of its services.

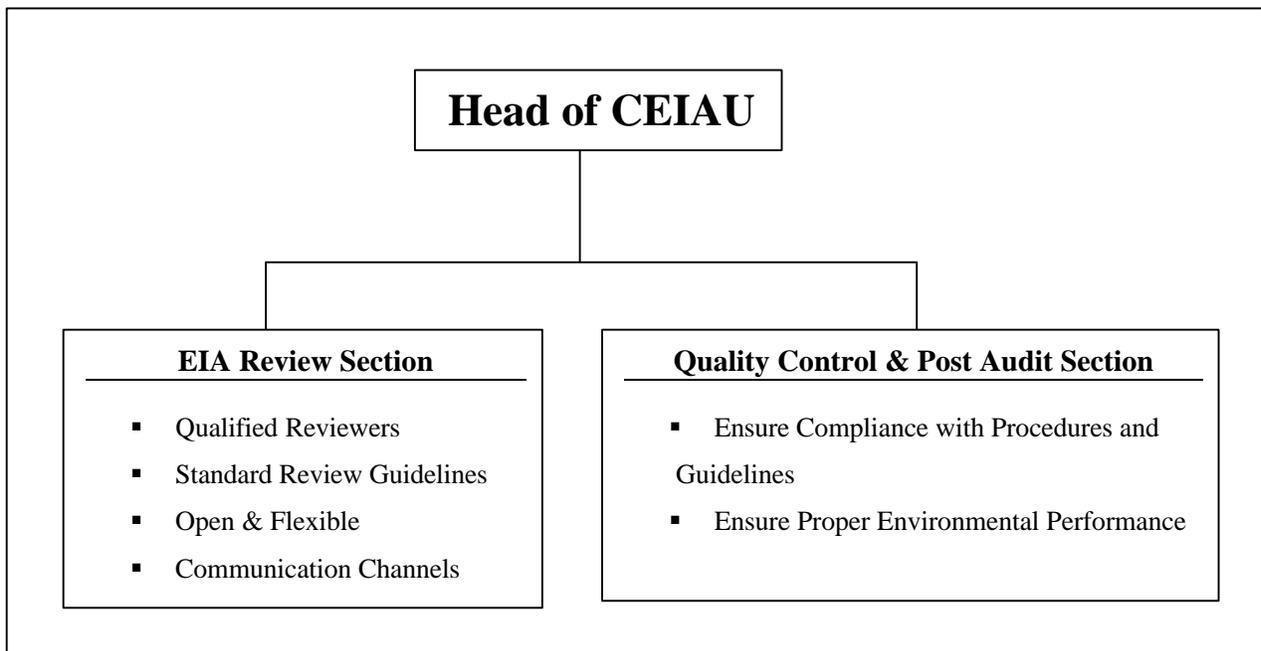
The EIA Review Section

The main role of this section is to organize and manage the EIA review process. This would require understanding of the type, nature and components of the projects to be reviewed. It is also necessary to have access to a roster of qualified EIA reviewers in all fields in which the Ministry's proposals fall. Equally important is the preparation of clear guidance to reviewers on areas of review, in order to receive an objective review and final opinion regarding a specific EIA. There are several internationally accepted EIA review guidelines that could help in this task. Open and flexible coordination and communication pathways are necessary to provide for smooth operation in a timely fashion.

Quality Control and Post Audit Section

This technical section is responsible for ensuring compliance with the Ministry’s EIA procedure, standards, and guidelines. It is also responsible for carrying out post audits on operational projects to demonstrate the projects’ proper environmental performance and that required environmental issues (i.e. Mitigation measures, monitoring activities) are being adequately dealt with. These steps are of paramount importance since they assume the proper environmental performance of the Ministry’s projects in addition to building a good environmental image for the Ministry.

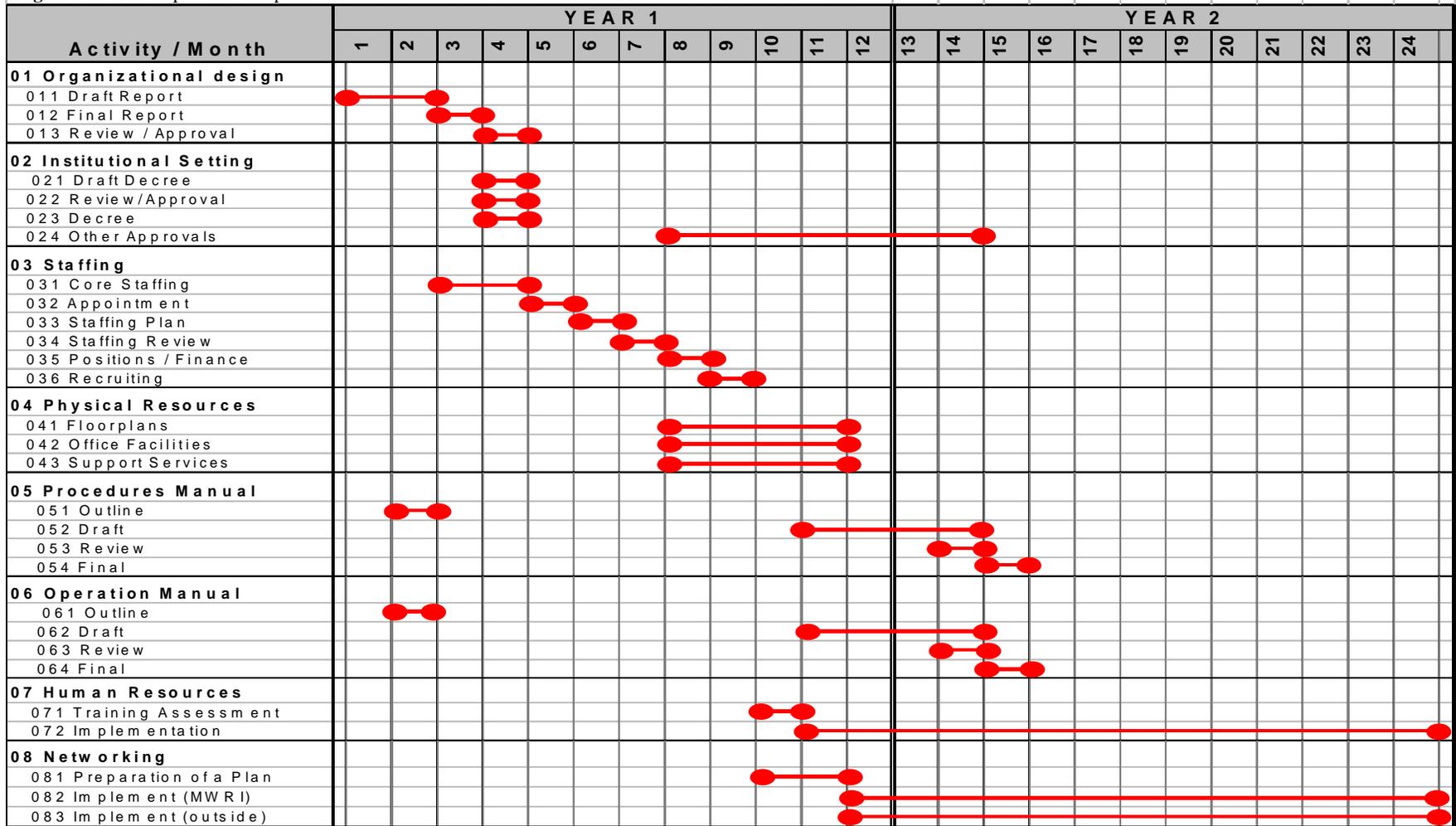
Figure 5.1 Organizational Structure of the Suggested Body



Recommended Implementation Plan

A recommended two-year plan to institute and activate the EIA process and establish a dedicated environmental unit within MWRI was developed by the Benchmark Working Group. Figure 5.2 depicts the proposed implementation plan.

Figure 5.2 Proposed Implimentation Plan for EIA Environmental Unit in M W R I



Activities included under this implementation plan include:

- Finalization of Organizational Design
- Institutional Setting
- Staffing of an environmental unit within the ministry
- Physical Resources
- Procedures Manual
- Operation Manual
- Human Resources Development
- Networking between other ministries and GOE agencies

Finalization of Organizational Design

The organizational design of the Environmental Unit and its location or placement within the Ministry will, in many ways, determine its function, performance, and effectiveness in applying the EIA process. A draft of the proposed organizational design of the Environmental Unit will be prepared within the first two months of the implementation plan for review. Comments on the draft plan will be compiled and included in the final plan to be submitted one month after review comments on the draft are received.

Institutional Setting

As with the organizational design of the Environmental Unit, the Unit's placement or institutional setting within the MWRI will have significant implications for the ability of the Unit to effectively apply the EIA process. Several alternate institutional settings have been proposed, including placing the unit directly under the office of the Minister, The Ministry's Central Affairs Department, or under the Ministry Planning Department. Final placement of the Unit within the ministerial framework will be left to the discretion of H.E. the Minister of MWRI. A draft Ministerial Decree is anticipated within the first two-weeks of the fifth month of the plan. Review and approval of the draft is expected to take little more than one week. A final decree will then be issued before the end of the fifth month. Other necessary approvals will be solicited between the eighth and fourteenth months of the implementation plan.

Staffing

A two-phased staffing approach of the proposed Environmental Unit is recommended. The first phase of staffing will establish the core individuals within the Unit and will commence once the draft organizational design report is finalized. A multidisciplinary group of qualified individuals from various sectors of the ministry will make up the core of the Environmental Unit. A two-month period is designated for establishing staffing criteria and identifying required staff qualifications. A one-month period is provided for appointment of core staff within the Unit.

The second phase of staffing will be initiated during month six of the first year of the implementation plan. The Phase 2 staffing plan will identify additional technical support personnel and administration necessary to round out the Environmental Unit and make it fully functional.

Once the Phase 2 staffing plan is complete, it will be submitted for the review and approval of the Organization Department. One month is provided for review and approval of the proposed staffing plan.

Once approval of the staffing plan is obtained, the recommended positions of the Unit will be secured and financed. Financing and securing staff positions with the Environmental Unit is expected to require one month.

Once financing of the positions is secured, staff will be recruited from outside the Ministry or from existing departments within the Ministry itself. This process is expected to occur during the ninth month of the first year of the proposed implementation plan.

Physical Resources

The newly established Environmental Unit will require physical operational resources, including a dedicated area within the Ministry with in to work, as well as ancillary support services. Office area requirements and a preferred office floor plan are to be calculated and prepared over a four-month period extending from the sixth

through the tenth month of the first year of the two-year implementation plan. Support Services are to be identified and established during the same four-month period.

Procedures Manual

Establishment of a dedicated Environmental Unit within the MWRI is a new endeavor. As such, a procedures manual will be required to define how the newly formed Environmental Unit will function and be integrated into the existing institutional framework. A four-step process for developing a final procedures manual is recommended under the proposed plan. An outline of this manual should be prepared early in the implementation plan. This outline will be completed over a two-week period during the second half of the second month. A draft of this manual will be created over a four-month period, commencing at the beginning of the tenth month of the proposed plan. The draft will be initiated once the unit is fully staffed. Review of the draft manual will be completed during the third month of drafting and a final manual will be prepared during the following month.

Operation Manual

Consistent and diligent application of the EIA process for all pertinent MWRI Project activities is paramount to the successful implementation of EIAs with the Ministry. To define consistent operating procedures of the Environmental Unit within the Ministry and between the unit and other ministries and agencies, development of an operation manual is recommended. Development of this manual is to occur concurrently with the development of the procedures manual.

Human Resources Development

Once established, training of Environmental Unit personnel will be required. An assessment of training needs will be conducted to determine the level of effort and specific training needs of the Environmental Unit. This assessment is expected to require one month and is scheduled to occur during the tenth month of the first year of the implementation plan. Implementation of the required training will commence during the end of the tenth month and will extend through the end of the second year of the implementation plan.

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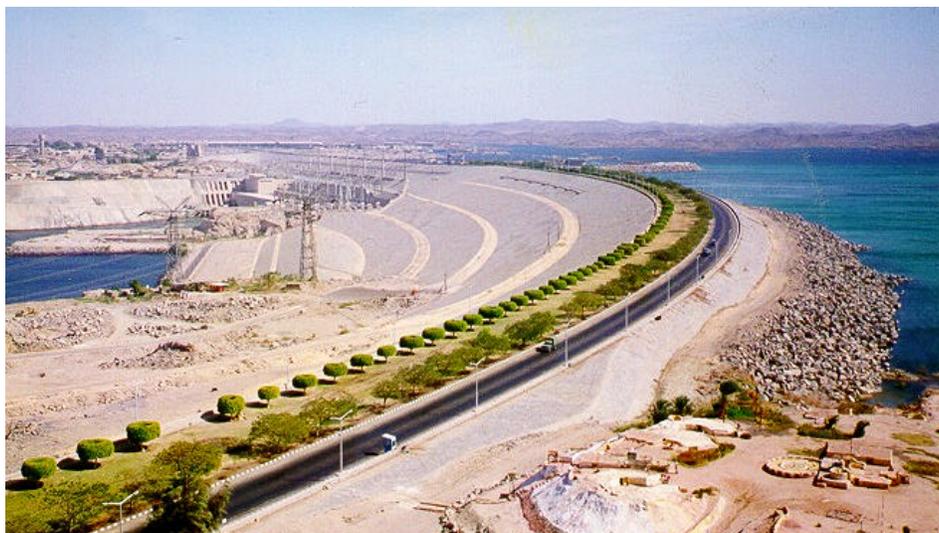
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**Ministry of Water Resources and Irrigation
US Agency for International Development
Agricultural Policy Reform Program
Environmental Policy and Institutional Strengthening Indefinite Quantity Contract**

**APRP—Water Policy Activity
Contract PCE-1-00-96-00002-00
Task Order 807**



ENVIRONMENTAL MANAGEMENT AT MWRI

***Report No. 51
Appendices***

December 2001

Water Policy Program

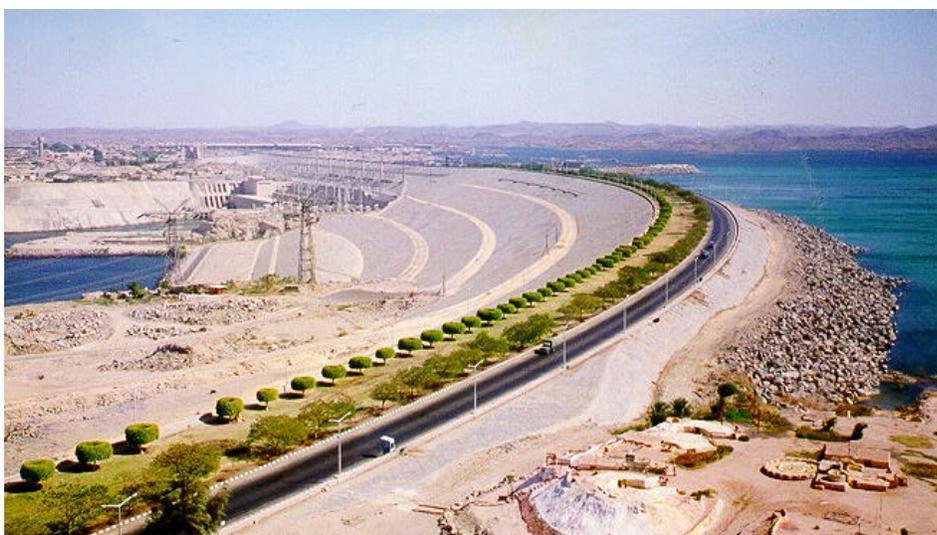
International Resources Group

Winrock International

Nile Consultants

APRP Water Policy Program

**APRP—Water Policy Activity
Contract PCE-1-00-96-00002-00
Task Order 807**



ENVIRONMENTAL MANAGEMENT AT MWRI

***Report No. 51
Appendix A***

December 2001

Water Policy Program

International Resources Group

Winrock International

Nile Consultants

EIA Source Book



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5.3.1.1.1.1.2 October 2001

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1. Introduction

1.1 Overview

The Ministry of Water resources and Irrigation (MWRI) is responsible for planning and implementation of water resources management and all the water related development projects. The importance of water and water related projects are an acknowledged fact. It is well known that these projects generate benefits through production of crops and energy to meet local demands as well as export earnings. Other sustainable economic development projects like dams and reservoirs can be used for drinking water supply, flood control, fisheries and water-based recreation.

To ensure the sustainability of its activities and to help preserve a better environment to the Egyptian people, the Ministry aims to fully incorporate the environmental dimensions into the planning, construction and operation of the growing water related developments. Accordingly, the Ministry plans to establish a mechanism for addressing the environmental issues while coordinating its relationship with other concerned stakeholders. As a start step this mechanism will be mainly based on applying environmental impact assessment (EIA) for all new projects to be executed by the Ministry.

1.2 Purpose

The Water Policy Advisory Unit (WPAU) intends to support the MWRI through the formulation of an environmental policy to adequately address all

environmental concerns in Egypt's water resources development and management. It is intended to achieve this objective through identification of mechanisms and procedures for ensuring that environmental aspects are addressed in MWRI water resources planning, operation, and management activities. Furthermore, specific channels for coordination between MWRI and other agencies responsible for environmental matters will be defined. Increasing the awareness of the Ministry's staff, at all levels, of the importance of integrating environmental parameters in all water management activities, is also essential.

This source book will support the EIA process in the Ministry. The integration of an EIA process will enable the Ministry to plan for its projects while minimizing irreversible environmental damages. EIA will help the selection and design of projects, programs or plans with long-term viability and thus improving cost effectiveness.

6.3

6.4 1.3 Organization of the Report

The report consists of four chapters in addition to five annexes.

The current chapter is an introduction discussing the background and purpose of this report.

Chapter two explains the EIA the process and describes the general procedures for the EIA preparation and review in Egypt.

Chapter three is an overview of the MWRI activities. The chapter also includes grouping these activities according to their environmental impacts.

Chapter four describes the activities included in the EIA process and identifies the roles played by the Ministry within this process.

2. Environmental Impact Assessment (EIA)

2.1 What is EIA

Sustainable development is defined as the development that meets the need of today's generation without compromising those of future generations.

The environment is the backbone of the economy, the source of livelihood as well as a source of natural wealth. As the pressure of industrialization, urbanization and use of the resource base increases, there is a need for resources to be managed in a prudent manner. One of the tools for doing this is environmental impact assessment (EIA).

EIA is defined as the systematic identification and evaluation of the potential impacts of proposed projects, plans, programs or legislative actions relative to the physical-chemical, biological, cultural, and socioeconomic components of the environment.

The role for EIA was formally recognized at the earth summit held in Rio 1992. Rio principle 17 states “ *Environmental impact assessment, as a national instrument, shall be undertaken for proposed activities that are likely to have a significant adverse impact on the environment and are subject to a decision of a competent national authority*”.

The purpose of EIA is to ensure that development proposal, activities and programmes are environmentally sound and sustainable. EIA is a planning tool used to predict, analyze and interpret the significant environmental effects of a proposal and to provide information that can be used during decision-making.

EIA can be used to minimize or prevent adverse effects and at the same time help to utilize the resources in a sustainable manner and maximize the benefits of a proposed development.

6.5 2.2 EIA as a process

EIA is a process that can:

- Modify and improve the design of a proposal;
- Ensure that the resources are used efficiently;
- Enhance the social aspects related to the proposals;
- Identify measures for monitoring and managing impacts, and
- Facilitate informed decision-making.

Best practices for EIA have an ongoing role during protective implementation phases. The environmental consequences of a project can be further minimized by appropriate mitigative and monitoring measures.

EIA involves gathering and analysis of all relevant information on a proposal to determine the likely consequences if this proposal is implemented in a given area, and if it should, what appropriate mitigation or alternatives must be considered in order to ensure environmentally sound and sustainable implementation or development.

An ideal EIA system would:

-
- Apply to all projects that are expected to have significant environmental impacts and address all impacts that are expected to be significant.
 - Compare alternatives to a proposed project, management techniques and mitigation measures.
 - Result in a clear report, which conveys the importance of the likely impacts and their specific characteristics to non-experts as well as experts in the field.
 - Include broad public participation and stringent administrative review procedure.
 - Be timed so as to provide information for decision making.
 - Be enforceable.
 - Include monitoring and feedback procedure.

6.5.1.1 2.3 EIA General Procedure

Usually the proponent is responsible for carrying out the EIA. The requirements for the EIA may be set out in law, guidelines or other procedures depending upon the stakeholders of the project. Sometimes it may be necessary for the proponent to comply with more than one set of procedures. In this case, the need for good planning is even more important.

EIA is usually carried out by a team of people appointed specially to the task, with an appropriate range of scientific, economic, and social expertise. This group of people acts as an interdisciplinary team, meeting together to plan a systematic process for carrying out the study. The team leader (often called the EIA project manager) plays a key role in the successful outcome of the process.

Not all projects need an EIA. Different EIA systems use different methods of choosing, or screening projects to decide which will not significantly affect the environment and which will. Some systems designate projects or areas using

threshold lists. Others use judgement or initial evaluations to determine environmental significance based on proposal type, size, cost, the sensitivity of the environment to development, or the strength of community opinion.

The exact components, staging and responsibilities for an EIA process will depend upon the requirements of the country or donor. However, most EIA processes have a similar structure as depicted in Figure (2.1). The main stages are:

6.5.2 Screening:

An initial assessment to decide whether a project requires further investigation in an EIA.

Scoping:

To identify the key impacts requiring further investigation, and prepare the terms of reference for the study.

Assessing:

The identification, analysis and evaluation of the significance of impacts.

Mitigation:

Developing measures to prevent, reduce or compensate for impacts or environmental damage.

Reporting:

Presenting the results of the impact assessment in a useful format.

Reviewing:

Assessing the adequacy of the EIA report, taking account of the points of view of stakeholders and assessing the acceptability of the proposal in terms of existing plans, policies and standards.

Decision-making:

To decide whether the proposal can proceed and under what conditions. The decision-maker has the option to request that the proposal be rejected or

redesigned (or some aspects to be redesigned) so that environmental effects are minimized.

Monitoring and Management:

Implementing mitigation measures, monitoring impacts for compliance, checking that they are as predicted. Taking necessary action to ameliorate problems if they appear.

Public Involvement:

Public involvement takes place typically during the scoping and reviewing phases of EIA but many also occur at any of the other stages of the EIA process. Public involvement programmes can range in purpose from those that aim only to provide the public with information, through to those that encourage the full involvement of the public in the decision-making process. Public involvement must be carried out in a manner that is appropriate to the culture of the people concerned.

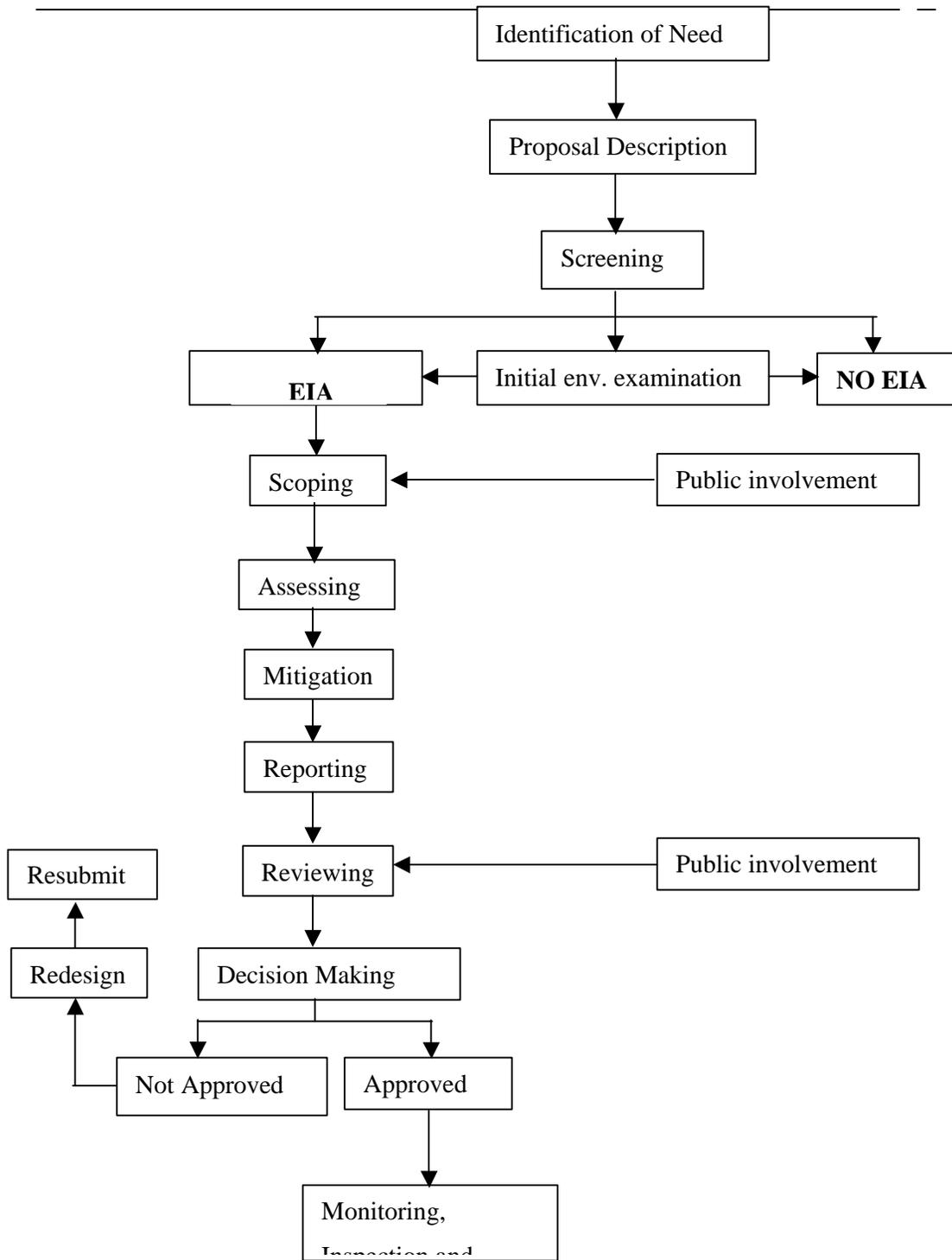


Figure (2.1) : EIA General Process

1.1

2.4 EIA in Egypt

In February 1994, the Government of the Arab Republic of Egypt has issued law No.4/94 concerning protection of the environment. The objective of the law was not only addressing pollution measures and control, but also involved new developments and projects including expansions of the existing ones.

New establishments are required to carry out an Environmental Impact Assessment (EIA) before construction. Articles no.19 through 23 and 70 through 73 of law 4/94 stipulates measures related to the EIA. Relevant articles in the Executive Regulations complement the law. The executive regulations were issued by the Prime Ministers decree No.338 of 1995.

Law 4/94 defined the Egyptian Environmental Affairs Agency (EEAA) as the national institution mandated by implementation of the law with particular attention to the EIA regulations. Several international donors had contributed to setting-up the EIA system in Egypt since 1993.

Several discussions had taken place in 1994 between EEAA and the line ministries, following that guidelines for EIA has been issued by the agency in 1996.

According to the law for the Environment (lawNo.4/1994), EEAA was established and replaced the Agency established in 1982 in all rights and obligations. The EEAA has a public juridical personality and is affiliated with the competent Minister for Environmental Affairs. In this respect, the EEAA formulates the general policy and prepares the necessary plans for the protection and promotion of the environment law, enforcement is another mandate given to the agency.

Despite the limited human resources at the agency, law enforcement is becoming one of the top priorities in recent years, many cases had been sent to the court in the past two years – in coordination with the competent administrative authority- particularly for establishments that violated the law for the environment.

6.5.2.1.1 2.5 EIA Procedures in Egypt

Law 4 states that the EIA of certain establishments or projects must be evaluated before any construction works are initiated or license is issued by the competent administrative authority or licensing authority.

The executive regulations to law 4, identify establishments or projects which must be subjected to an EIA based upon the following main principles:

- Type of activity performed by the establishment.
- Extent of natural resources exploitation.
- Location of the establishment.
- Type of energy used to operate the establishment.

The number of projects subjected to this provision is many forms a heavy burden to administrative authorities and the EEAA. A flexible system for the management of EIA projects has therefore been developed in order to use limited economic and technical resources in the best possible way.

The system encompasses a flexible screening system and projects are classified into three groups or classes reflecting different levels of environmental impacts according to severity of possible impacts on the environment.

- A white list projects for establishments with minor environmental Impacts. The project proponent has to fill in the environmental screening form “A”.

- A grey list projects for establishments, which may result in substantial environmental impact. The list includes establishments to be screened for major environmental impacts. The establishments are categorized by activities, quantity of production and project size. In case of establishment with production capacity limits specified, all sizes are included. The proponent has to fill out environmental screening form “B”. The procedure consists of two stages, filling out form B and possibly followed by a scoped EIA on certain identified impacts / processes.

- A black list projects for establishments, which require a full-fledged EIA due to their potential impacts. The establishments are screened by activities, quantity of production and project size. In case of establishment with production capacity limits specified, all sizes are included.

Categories of white, grey and black were first suggested by the Danish consultants who had contributed largely to the set-up of the EIA system in Egypt. They suggested a system similar to that used in the European Union, World Bank and Malaysia, and used the limits of Nepal with white, grey and black categories. Furthermore, it was suggested that activities should be adapted to the Egyptian System (Abul-Azm, 1999).

The guidelines were first presented late 1996 to the investors, bankers and NGO's. The law had specified that the proponent should submit the EIA form or study to the EEAA through the competent Administrative Authority (CAA). The EIA must then be reviewed by EEAA. The agency had always utilized the knowledge of our national consultants represented by the universities and research centers staff members. Services of international consultants were utilized in number of cases through DANIDA.

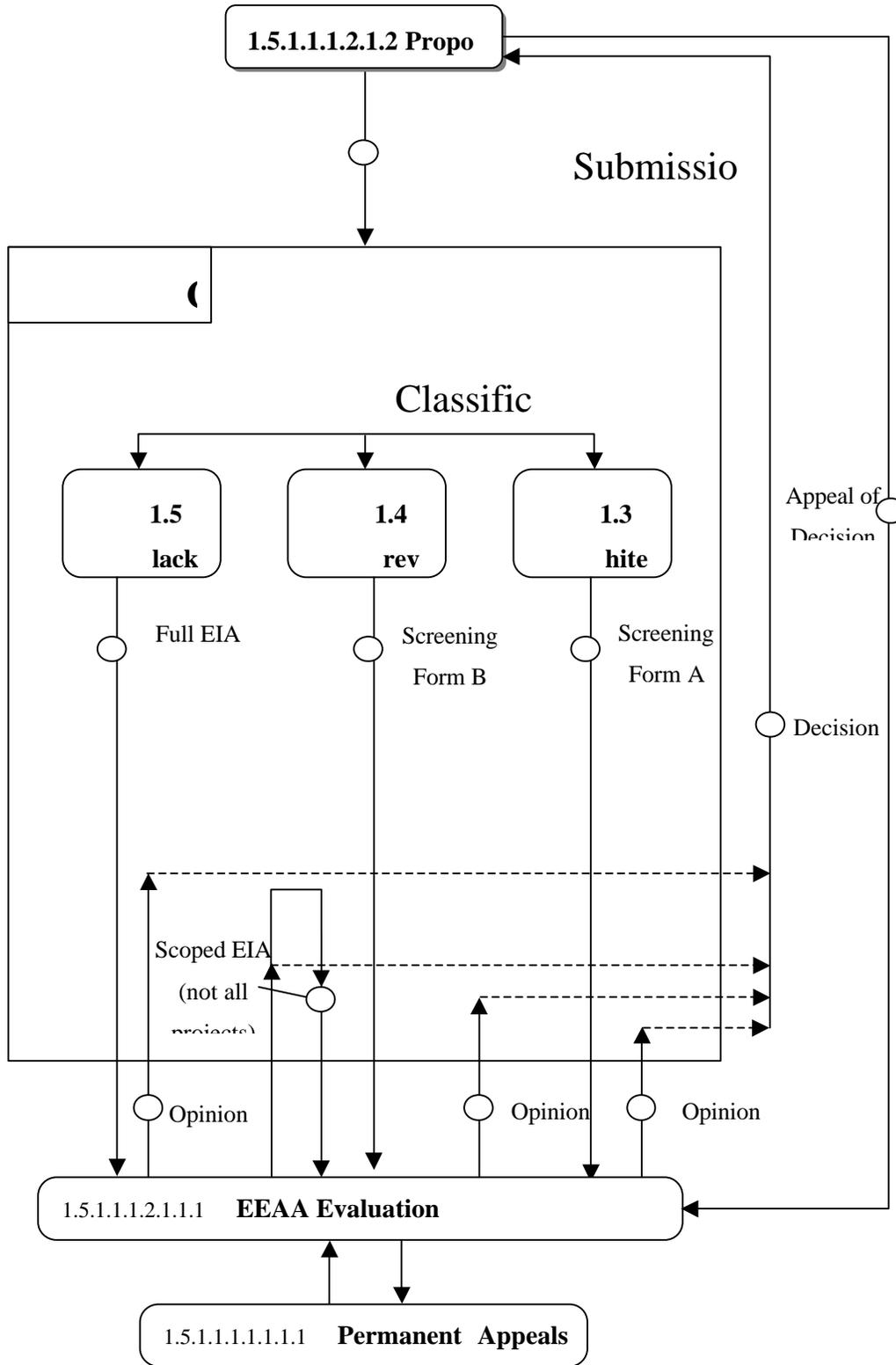
According to law 4/94, EEAA evaluation process should take a maximum of 60 days, otherwise considered approval. The law had also allowed for a permanent appealing committee as discussed in the law, the executive regulations and the EIA guidelines. Figure (2.2) presents the EIA procedure as described in Law 4/94 for the environment.

Since 1994, EEAA had started to receive EIAs from different competent Administrative Authorities. The number of CAAs dealing with EEAA has increased from 4 CAA's in 1994 to 55 CAA's in 2001 (Abul-Azm, 2001).

Since the issuance of law 4 in 1994, EEAA faced the limited experience within the national consultants. The Agency had relied on International community for the technical support in the beginning. Experience in the field of EIA had started to grow up either outside or inside the agency. However, the agency still lacks the needed technical capacity either to generate the studies or review.

The agency is currently relying on the university professors in the review system; they are also taking the role to build up the capacity for our new generation at the agency. EIA quality is still a problem facing the EEAA, as an accreditation system is still needed to certify the consultants to overtake studies in Egypt.

In the past three years and due to an aggressive campaign headed by the minister of state for the environment, the number of EIAs received at the agency had started to increase drastically. In the year 2000, over 10,000 EIA's were received and reviewed by the EEAA. The contribution of the Governorates, as CAAs, had noticeably increased in the past years (Abdel-Gelil and Abul-Azm, 2001).



1.5.1.1.1.2

Figure (2.2) EIA cycle system to process

During 1998, statistics show that EEAA's evaluation of the black projects was 30% acceptance, 3% disapproval, 67% others, which were mainly returned to the CAA for missing information or incompleteness.

In 1999, about 30% of the EIA sent to the EEAA indicated that:

- The activity should be exempted from presenting an EIA.
- The activity had violated law 4/94 by starting operation prior to submitting an EIA, which indicates that EIA, is used as an enforcement tool.
- There are Missing information or incomplete form.

The EIA system in Egypt is still facing many challenges among them:

- The limited human resources in the agency.
- The increased quantity of the studies submitted to the agency particularly small projects, types A and B.
- The poor quality of the EIAs particularly for the full fledged EIAs.
- Scarcity of experts in fairly new issues.
- The need to face the new challenges for development in the future.
- The need to develop a common language with the investor and the CAAs.
- Lack of cooperation with some line ministries.
- The limited time of 60 days given by law 4/94.
- The absence of land-use plans which could have assisted in the decision making process, especially for small projects.

EEAA believes the paramount importance of the following

- The need to decentralize decision.
- The need to issue guidelines and checklists to standardize the process for proponents or consultants reviewing the study.
- The need for building the capacity of the EIA staff inside the agency.

In order to fulfill its objectives and reach an efficient level of work, EEAA had issued a more exhaustive new list of activities for establishments under A, B or C category. In drafting those lists, several laws and guidelines has been revised, together with the experience of EEAA during the past 7 years.

Standard condition had been set for the type “A” projects and most of type “B” projects. Scoped EIAs and full-fledged EIAs are still reviewed by consultants. In some cases by two consultants are required. In the mean time, EEAA had issued specific guidelines for projects assisting in the preparation of EIAs of specific activities as; industrial estates, tourist development centers, sewage treatment plants, land reclamation, Harbors, Ports and Marinas, cement industry, oil and gas sector, and urban development, concentrating on the regional development for each sector.

The specific guidelines will assist the proponent to reach an acceptable quality of the study. Main features of the guidelines include:

- Basic data, including health, economic and social analysis.
- Measurements and numerical model results if needed.
- Impacts including these on the natural environment or the society.
- Alternatives for location and /or technology.
- Mitigation.
- Monitoring program as part of an Environmental Management Plan.

Checklists are used during the review process to standardize the decision-making.

The Ministry of state for environment had also introduced a new decentralization element in handling the EIAs. The screening form A, will be sent to EEAA Regional Branch Offices (RBOs). The RBOs will be provided with lists of projects falling under his category. Standard conditions for

approval will be attached to the modified list in order to simplify the role of the reviewing authority.

Most importantly EEAA had also established new lines of communication with some line-ministries, such as tourism and Petroleum to facilitate the EIA review system and to include all the stakeholders in the process.

2.6 Multi dimension in EIA

The environment can be defined as the aggregate of features and conditions that surround or envelop every living and non-living components. It can be basically divided into the physical, biological and social environment.

The physical environment includes; geology, topography, soil, climate and meteorology, ambient air quality, surface and groundwater hydrology, coastal and oceanic parameters, existing sources of air emissions, existing water pollution discharges and receiving water quality. In addition it includes the built components that were added by man such as buildings, dams, infrastructure, etc..

The biological environment includes; flora, fauna, rare or endangered species, sensitive habitats, including parks or preserves, significant natural sites, species of commercial importance and species with potential to become nuisances, vectors or dangerous.

The socio-cultural environment includes; population, land use, planned development activities, community structure, employment, distribution of income, goods and services, recreation, public health, cultural properties, tribal peoples and customs, aspirations and attitudes.

Accordingly, it is clear the EIA preparation is a multidisciplinary process requiring expertise in different field. However, a preliminary investigation of the project's nature and location has to be carried out before addressing all the above-mentioned features. These features are the generic environmental

attributes that should be addressed in an EIA study thus, some of them are non relevant for some projects.

3. MWRI Water Activities – General EIA Considerations

3.1 MWRI Responsibilities

The MWRI is unique with respect to EIA. It sometimes is responsible for licensing projects while, in other times it proposes projects of its own. Therefore, the Ministry plays two roles within the EIA system.

3.1.1 As a developer

The Ministry acts as the proponent/developer for some projects example the Esna barrage. It initiates the projects according to the national needs and carry out the planning and implementation of the project. The Ministry, acting as a developer, will be responsible for preparing the EIA and following the respective national procedures.

3.1.2 As a Competent Administrative Authority (CAA)

For some projects, the Ministry acts as the entity issuing licenses (CAA). It receives the EIA, submitted by the developer, and sends it to EEAA for review and comments. The Ministry takes EEAA's comments into consideration

when issuing the licenses. Developments around lake Nasser are examples of projects where the Ministry acts as the CAA.

3.2 EIA in Egyptian Water Resources Development

Although there is no formal EIA system in the MWRI yet, several environmentally related activities have been implemented by the Ministry reflecting inherent environmental awareness. It is worth mentioning that the Ministry prepared an EIA even before the issuance of law 4/1994. The EIA addressed the Northern Sinai Agricultural Development. The Ministry also participated in several activities reflecting its environmental awareness including;

- *Preparing EIAs.*
- *Establishment of three environmental units within the Ministry*
- *Participating in various environmental activities (training courses, monitoring, energy conservation, etc...)*

3.2.1 Preparing EIAs

Several EIA Studies have been conducted by the MWRI. The following are some examples of these studies.

- *An EIA study for Northern Sinai Agricultural Development Project (El-Salam Canal). The study was funded by the World Bank and carried out in 1992 by Euroconsult in association with Pacer and Darwish Engineers.*

- *The North Sinai Development Agency undertook a feasibility study including an EIA for the North Sinai Integrated Rural Development Project (Phase II) in 1997. The study was funded by JICA and was carried out by SANYU Consultants Inc. and Pacific Consultants International.*
- *The third study was an EIA for the South Egypt Development (Toshka) Project. The study was undertaken by the Center for Environment and Development for the Arab Region and Europe (CEDARE) in 1998. The study followed the EEAA guidelines together with a checklist approach developed by CEDARE.*
- *The fourth is a feasibility study, including an EIA, funded by the KFW, for the New Naga Hammadi Barrage and Hydropower Project. An environmental group has been established in the Ministry for the purpose of this study. The group consists of local and foreign experts.*

3.2.2 Environmental Units in the MWRI

Three environmental units have been established in the MWRI. The Mechanical and Electrical Department initiated an environmental unit in 1998. The Egyptian Public Authority for Drainage Projects (EPADP) has established an environmental unit under the Planning and Follow-up Department

in 1999. The Irrigation Improvement Department also has an environmental unit.

3.2.3 Participation in Various Environmental Activities

- *The Irrigation Improvement Sector has four engineers who received short EIA training in the USA and Japan. Two engineers from the Reservoirs and Grand Barrages Sector received EIA training in Germany. One staff member in the Strategic Research Unit of the National Water research Center (NWRC) has a M.Sc. degree in environment.*

- Some efforts have been undertaken for the assessment of the effects of the low quality drain water on pumping stations. In 1991, a World Bank EIA expert has conducted a study, and subsequently, the Drainage Research Institute has conducted studies in 1996 for El-Tabia Pumping Station. Presently, a local consultant is aiding in conducting assessment studies for some drainage water pumping stations in middle and northern Delta, in coordination with EPADP.

- The EPADP cooperated with a local consultant to publish two reports concerning Environmental Assessment Issues.

- In addition, the NWRC institutes had conducted the following activities:
 - The Drainage Research Institute (DRI) conducted several studies of water quality monitoring throughout Egypt. Further, the DRI participated in the development and operation of a water quality software (SIWARE).

- The Research Institute for Groundwater (RIGW) conducted several studies regarding groundwater pollution and seawater intrusion. Further, the institute is responsible for a network of piezometers for water level and quality monitoring, covering Egypt's aquifers.
- The Strategic Research Unit (SRU) participated in a Canadian and an Italian funded project for establishing a decision support system based on environmental balance.
- The Nile Research Institute (NRI) conducted a Canadian funded project for integrated Nile development in the early 90's.
- The Hydraulic Research Institute (HRI) conducts a wide range of hydraulic studies, which can provide support for any EIA study requiring such expertise.

3.2.4 EIA Capacity Within the Ministry

The NWRC of the MWRI has institutes covering different aspects of water-related phenomena. Each institute specializes and excels in a certain aspect. The EIA is a multidisciplinary, or better interdisciplinary, exercise. The EIA for any project of the MWRI will require the expertise of several disciplines of physical, social and biological sciences. Thus, experts from the different institutes can contribute to a successful EIA. Further, the NWRC has a multitude of laboratories, computer software and hardware, field equipment etc., covering the different aspects of water resources assessment and management. Moreover, a wealth of national water quantity and quality data exists in the different institutes.

To foster this expertise, a mechanism needs to be established to channel the individual efforts of the institutes into interdisciplinary teams, properly balanced and adjusted for the specific study. Capacity building will be necessary in some aspects. Some external expertise might also be required, for example for social, economical or biological aspects. Another important aspect is efficient sharing of data and information among the different agencies of the MWRI, as well as between the MWRI and other stakeholders with relation to Egypt's water resources.

3.3 Grouping MWRI Activities

6.5.3 3.3.1 Legal and Administrative Background

Some of the projects implemented by the MWRI have been classified into A, B and C lists in the EIA guidelines published by EEAA in 1996. The Guidelines also provided EIA preparation guidance for category C projects for "Agricultural Land Reclamation" and "Irrigation and Drainage". EEAA classifies MWRI's projects is as follows:

Type A: Proposed expansion or modification of existing irrigation and drainage structures where the expansion or modification would lengthen the structure by 10% or less.

Type B: Proposed expansion or modification of existing irrigation and drainage structures where the expansion or modification would lengthen the structure by more than 10%.

Type C: New irrigation projects including dams and barrages.

As can be noticed, the projects represented in the above classification are limited and do not cover the broad spectrum of the activities of the MWRI. Thus, it is attempted below to include in the classification other projects undertaken by the MWRI, following the same classification methodology adopted by EEAA. This classification is presented in the following section.

6.6 3.3.2 Types of projects undertaken by the MWRI

The following listing of projects shows the main types of projects undertaken by the MWRI. It has mainly been extracted from the MWRI five-year plan 1997/98 – 2001/02, as well as from other publications produced by the MWRI.

1. New Irrigation Projects

Infrastructure of new irrigation projects, including:

- Construction of canals
- Construction of pipeline conveyance systems
- Pump stations
- Hydraulic structures such as gates (manual and/or automatic), barrages, weirs, diversions, siphons, escapes
- Service projects such as bridges and channel access roads
- Groundwater extraction
- Drainage systems (including open and tile drains, pump stations, mixing stations, final discharge pump stations,
- Community development and housing (in some expansion projects such as North Sinai Development Project)

2. Irrigation Improvement Projects

Irrigation improvement comprises the following projects and activities:

- Renovation of the delivery system
- Change of the irrigation concept from supply-based to demand-based irrigation
- Widening and/or extension of canals
- Installation of modern control structures
- Replacing traditional ‘mesqa’ by buried pipes
- Replacement of hydraulic structures such as aqueducts, regulators, bridges, barriers
- Preventive maintenance of canals and hydraulic structures
- Construction of pump stations
- Rehabilitation and renovation of existing pump stations
- River banks protection and development

- Canal lining
- Canal maintenance and weed removal
-

3. Drainage Projects

- Construction of open drains
- Construction of tile drains
- Pump stations
- Mixing pump stations
- Agricultural drainage water reuse
- Municipal wastewater reuse
- Industrial wastewater reuse

4. Dams, Barrages, Reservoirs and Flash Flood Protection

- Rehabilitation of barrages (with or without hydropower station)
- Rehabilitation of locks
- Construction of new barrages (with or without hydropower station)
- Construction of new locks
- Flash flood utilization (through construction of dams or dikes)

5. Shore Protection Projects

- Rehabilitation of shore protection works
- Construction of new shore protection works

Tables (A.1 annex A) shows the classification of the projects in each of the above five groups, into A, B and C categories.

6.7 3.4 Potential Environmental Impacts in Each Activity Group

As mentioned earlier in the previous section, the projects and activities of the MWRI were grouped as follows:

1. New Irrigation Projects
2. Irrigation Improvement Projects
3. Drainage Projects
4. Dams, Barrages, Reservoirs and Flood Protection Projects
5. Shore Protection Projects

In this section, the environmental aspects of each of the groups will be discussed in detail.

6.7.1

6.7.2 3.4.1 New Irrigation Projects

Agriculture in Egypt is almost entirely dependent on irrigation from the Nile, since there is no significant rainfall except in a narrow strip along the Mediterranean Coast. The agricultural land base consists of old land in the Nile Valley and Delta, rain-fed areas, several oases and lands reclaimed from the desert.

The Government of Egypt is presently encouraging the reclamation of desert areas. The Ministry of Water Resources and Irrigation is therefore involved in new irrigation projects through the Sector of Horizontal Expansion and Sinai Development Authority. New water projects such as El Salam Canal and Toshka, are being carried out. These projects will influence the distribution and use of available water resources. Moreover, horizontal expansion is one of the main targets for enlarging the cultivated area in Egypt.

These projects will create new employment opportunities during project construction and operation. They will also improve farming practices of settlers and improve their medical and sanitary conditions. Moreover, settlers will enjoy land tenure improvements, land registration for the local population and settlement of nomadic tribes. These projects may also cause the development of new agro-ecological habitats and introduce new fishery resources.

The type of project depends on the source of water (surface or groundwater, re-used drainage water), means of water storage, conveyance and distribution system, and methods of delivery (field application). These projects include the following facilities and infrastructure: (a) diversion and intake facilities, (b) wells, pumping stations, canals, ditches and pipelines for the conveyance of water, (c) distribution systems for sprinkler and drip irrigation. Sprinkler and drip irrigation show great potential for maximizing the efficiency of water use and reducing irrigation-related environmental problems.

Potential environmental impacts of most of the large projects include water logging and salinization of soils, increased incidence of water-borne and water-related diseases, resettlement or changes in the lifestyle of local populations, and increases of agricultural pests and diseases resulting from the elimination of dry climate die-back and creation of a more humid microclimate. Expansion and intensification of agricultural projects causes increased erosion, pollution of surface and groundwater from agriculture biocides, deterioration of water quality, and increased nutrient levels in the irrigation and drainage water resulting in algal blooms, proliferation of aquatic weeds and eutrophication in irrigation canals and downstream waterways.

- 7 The potential direct negative impacts resulting from over-tapping of groundwater for irrigation are lowering of the water table, land subsidence, decreased water quality, and saltwater intrusion (in coastal areas).

As for the reuse of agriculture drainage water in irrigation, it has the potential of transmitting communicable diseases. People at risk include agricultural workers, consumers of produce from the wastewater-irrigated fields, and people living nearby. An additional risk exists if sprinkler irrigation is used since it causes the dispersion of pathogens through the air. The severity of the

impact depends on the extent of treatment given to the wastewater prior to reuse. There is also a potential for polluting the groundwater. Moreover, if the wastewater is mixed with industrial wastes, there is a potential of accumulation of chemicals and heavy metals in the soil.

Table B.1 (Annex B) lists details of the most common potential environmental impacts and their mitigation measures.

7.1.1

7.1.2 3.4.2 Irrigation Improvement Projects

Irrigation improvement is achieved through (a) rehabilitation or restoration of dilapidated facilities, (b) modernization which implies changes to the system to meet new needs and to improve standards or utilize a more effective technology, or (c) introduction of new management systems. Irrigation improvement schemes offer an opportunity to incorporate remedial measures for any existing irrigation problems.

Economically these projects are characterized by high rate of return especially when the infrastructure exists. However, this may not be the case if new technology solutions are introduced such as buried pipelines, use of supplementary well irrigation, or use of drip or sprinkler systems. A difference between establishing a new project and improving an existing one is that the existing have already changed the environment both in the project area and in the area immediately surrounding it. This applies to the physical as well as the biological and social environment.

7.1.2.1

Egypt has launched an irrigation improvement program (IIP) which includes improvement of water delivery system, a farm-water management, irrigation methods and associated agronomic practices. The program intends to improve land leveling in crop fields and distribute water more equitably along canals with the continuous flow, which helps decrease the deep percolation. Canal seepage losses on tertiary canals or mesqas will be also reduced through canal lining and automatic gate control in the IIP areas. Canal tail losses, which accounts for 25-50% of the total water losses in irrigation will be eliminated through the night storage control. The resulting reduction of excess canal water released to the drains will likely increase the salinity concentration of the drainage water.

IIP projects also include those related to preventive maintenance of the canals, maintain the quality of the surface water and the cross section of the canal through dredging and weed removal. But the problem remains with the management and final disposal of the dredged material. Dumping of the dredged material on the banks of canals poses major health impacts. It will act as a breeding area for disease vectors.

As for the projects concerning replacement of structures such as aqueducts, regulators, bridges, barriers, siphons, and channel access roads, the major impacts from those projects result during the construction phase. Socio-economic impacts related to acquisition of land to serve the new structure may be faced.

Table B.2 (Annex B) lists details of the most common potential environmental impacts and their mitigation measures.

7.1.3 3.4.3 Drainage Projects

Drainage is a critical element of irrigation projects. Drainage flow comes from three sources: tail end and seepage losses from canals, surface runoff and deep percolation from irrigated fields. None of these sources is independent of the Nile. The deep percolation component is more salty and highly saline especially in the northern parts of the Delta due to seawater intrusion and upward seepage of groundwater to drains. The agricultural drainage of the southern part of Egypt returns directly to the Nile, where it is mixed with the Nile fresh water.

In the Delta, drain water is collected through farm tile-drains, branch drains and main drains. Drain water reused is practiced in three levels:

- Official reuse where the drainage flow is captured in main drains and mixed with main canal water at centralized mixing pump stations
- Unofficial reuse where drainage water is directly pumped by individuals farmers from a nearby drain
- Intermediate reuse: other reuse opportunities between reuse at main drain mixing stations and reuse by individual farmers.

There are two types of drainage systems: horizontal and vertical. Horizontal drainage is indispensable for the removal of surface water, and it is effective for water table control and prevention of water logging and soil salinization. It has the advantage of low construction and operation costs, and is useful for areas with saline groundwater and clay soil without an underlying aquifer suitable for drainage. Its major drawback is the limited depth of water table attainable. Drainage could be accomplished through open drainage canals or seepage to subsurface drains.

In areas where ground water is suitable for irrigation, vertical drainage used along with irrigation using groundwater is an effective means for preventing water logging and salinization, and for water conservation. The water table can be controlled at an optimum depth by adjusting the ratio of water extracted from the irrigation system. Vertical drain systems are particularly used in areas where there is a shortage of water supply.

The selection of drainage type depends on the composition and layout of the irrigation and drainage system. Vertical drainage is feasible if the aquifers have relatively high transmissivity and the top soils have relatively low hydraulic resistance. Moreover, the quality of the groundwater affects the feasibility of the drainage. The hydro-geological conditions of the fringe areas of the Nile make the vertical drain system feasible especially when large capacity wells are installed. This system also generates little surface drainage flow and will be almost free of pollution.

However, since horizontal drains may act as receptors of municipal, industrial as well as agricultural wastewater. They contain high concentration of organic matter, nutrients, fecal bacteria, agrochemicals, heavy metals and pesticides. These could be considered as open sewage systems. They have strong odor (hydro-sulfide), and form a potential risk for public health for the people living along their banks. Moreover, environmental risks also arise as the drains are extensively used for local “informal” irrigation.

Subsurface drainage is therefore being implemented to eliminate the problems associated with the operation and maintenance of the open drains. However, these drains need proper maintenance procedures to avoid their clogging.

Table (B.3-annex B lists the most common potential environmental impacts and their mitigation measures.

7.1.4 3.4.4 Dams, Barrages, Reservoirs and Flood Protection Projects

Projects for building dams or barrages and their associated reservoirs are usually planned for one of the following purposes: hydroelectric power, irrigation, domestic and industrial water supply, and flood control. The benefits of dams and barrages are to control flood and provide reliable and higher quality water supply for irrigation, domestic and industrial use.

As for flash flood protection, it includes both structural and non-structural means for protection against flash floods or reduction of flooding risk. Structural measures include dams and reservoirs, river channel modifications, dikes and levees, overflow basins, floodways and drainage works. On the other hand, non-structural measures

include regulations of floodplains uses through zoning, floodplain regulations, building and sanitary ordinances, and regulations of land use in watershed areas.

7.1.4.1 a. Dams, Barrages and Reservoirs

Large dam projects cause irreversible environmental changes over a wide geographic area and thus have the potential for significant impacts. The area of influence of a dam project extends from the upper limits of the catchment of the reservoir to as far downstream as the estuary, coast and offshore zone. It includes the watershed and the river valley below the dam.

Construction of these structures results in environmental degradation due to dust emissions, erosion and disposal problems. Greater impacts result during operation due to the impoundment of water, flooding of land to form the reservoir and the alteration of water flow downstream. These effects have direct impacts on soils, vegetation, wildlife and wild lands, fisheries, climate and the human population in the area. Sedimentation would result upstream of the structure and erosion downstream. There would also be a rise in groundwater table which affect nearby agricultural lands, towns and settlements.

Indirect effects include those associated with the building, maintenance and functioning of the dam (e.g. access roads, camps, power transmission lines), and the development of agricultural, industrial or municipal activities related to the dam.

On the social level, dam construction would provide considerable employment opportunities. However, reservoir filling would result in involuntary relocation of hundreds of dwellers, causing social readjustment to them and to those already living in the resettlement areas.

b. Flood Protection Projects

Major environmental impacts of structural flood control measures arise from the elimination of the natural pattern of flooding and the benefits flooding presents such as impoverishment of floodplain agriculture, natural vegetation, and wildlife adapted to the natural flood cycle. Moreover, channelization measures increase sediment loads causing sedimentation and altered water flows in the estuary, delta or near-shore coastal areas and effecting fisheries and sensitive coral reefs.

7.2 Tables B.4 a, b and C (Annex B) list details of potential environmental impacts and mitigation measures for dams, barrages, reservoirs and flood protection projects.

7.2.1 3.4.5 Shore Protection Projects

Shore protection projects are the only coastal projects executed by the MWRI through the Public Authority for Shore Protection. These projects include shore protection structures, which are used to control erosion at particular areas. However, they typically cause the accretion of sediments in one location and erosion in another. Unless these structures are carefully designed and located they can cause as many shore problems as they can solve. They include sea walls, bulkheads, revetment, groins, and breakwaters. The coastal erosion is either natural or manmade. The natural causes of coastal erosion include rise in sea level, protruding headlands, reefs and rocks, tidal entrances, shoreline geometry, removal of beach material by wind drift. The manmade activities include dams and other coastal structure, man-made entrances

including jetties, removal of material from the beaches for construction purposes.

Coastal construction projects impact the environment during construction and operation phases. These impacts vary according to the nature of the project, its location as well as its size. These impacts generally include alteration of the physical environment; since the above structures may alter the hydrodynamic system and hence sedimentation pattern.

These structures may have potential impacts on the marine environment during the construction and operation phases. The nature and degree of detailing depends on the type and importance of the project under consideration.

The main activities encountered in the construction phase include land and sea area occupation, dredging, breakwater and pier construction, quarrying, transfer of construction material, earthwork as well as the presence of a construction camp. The potential significant impacts of these activities include the disturbance of benthic biota and marine habitats, disturbance of local industries, change in coastal morphology, runoff and sediment release, coastal erosion, alternation of sediment transport pattern and dust emissions which may degrade the water quality.

As for the impact on the social environment, it includes visual and landscape impacts, noise, disturbance to public access, loss of recreational and fishing activities.

Table B.5 (Annex B) lists the details of the potential impacts and their mitigation measures.

7.3 3.5 Screening Forms and Sample TORs for the Different EIA Categories

In dealing with EIA, it is important to know whether the project in hand requires an EIA or not, and if so what level of assessment is required. Project lists presented in table (A.1) provide guidance to identify what projects require and the level of such EIA (i.e. A, B, or C).

For list (A) projects, the proponent will fill out the Environmental Screening Form “A” (Annex C).

For List (B) projects, the project proponent will fill out Environmental Screening Form “B” (Annex D). In this case, a scoped EIA on certain identified impacts/processes may be required.

For List “C” projects, a full EIA will be required. Annex “E” presents a sample TOR to be used for preparing a full EIA.

The sample TOR presented in annex “E” will also be used for preparing the “scoped EIAs” that might be requested following the review of the projects belonging to list “B”.

4. Conducting EIAs for MWRI Activities

7.4 As stated earlier, the Ministry plays a unique role within the EIA process. It either plays the role of both the developer and the CAA, for the projects it initiates and implements, or plays the role of the CAA for projects falling within its administrative authority. Tables (3.1 and 3.2) show the roles of various entities within the Ministry during the EIA process. The tables also show the supporting documents required during each activity within the

process.

4.1 EIAs for Projects Proposed by the MWRI

7.5 Playing both roles, CAA and the developer, the Ministry will be responsible for carrying out the following activities:

- Individual Sectors and/or Departments usually propose the Ministry's projects according to the national needs.
- At the initial stages of the project planning cycle, the proposing sector or department will use the screening lists (table 3.1) to classify the project as having no impacts (A), minor impacts (B) or major impacts (C).
- Based on the previous classification, the proposing sector (acting as the proponent) will have to fill out form (A or B) or carry out a full EIA either internally, in cooperation with other technical institutions/units, or through contracting external consultants.
- In case the project is classified in the white list; the environmental screening form (A) will be filled out and it is the only requirement.
- If the project is classified in the grey list; the proposing sector / department has to fill out the environmental screening form (B). This might be followed, in some cases, by a scoped EIA on some certain identified components that would be requested by the reviewing body.
- In case the project is classified in the black list; a full-fledged EIA has to be prepared by the proposing sector / department. The sector /

department will use the attached sample TORs (annex E) to prepare the required study.

- The sector / department responsible for the project and who has prepared the study, has to submit the EIA to be reviewed before the final step of decision-making.
- In preliminary phases, an internal body within the MWRI will be responsible for reviewing the EIAs and issuing its opinion to decision-makers. In subsequent phases, such studies will be submitted to EEAA and will follow the normal procedures.
- After the decision making, the proposing sector or department will then go on with the project implementation taking into consideration the review comments. The sector will also have to carry out the monitoring and post audit activities and keep an environmental register
- The monitoring and audit activities may result in further recommendations that will require corrective actions. These actions will be carried out by the sector / department in cooperation with the Ministry.

7.5.1.1.1.1.1 Table (4.1) EIA Process for Projects Proposed by the MWRI

7.6 EIA Process	7.7 Responsible Entity	7.8 Supporting or Required Documents
7.9 Initiation of the Project Proposals	7.10 Sector / Department	—
7.11 Screening (EIA is needed? What class?)	7.12 Sector / Department	7.13 Project lists (A, B, C)
7.14 EIA Initiation	7.15 Sector / Department	7.16 Screening Form A, screening Form B, Sample TORs full EIA Studies
7.17 Public Consultation /Involvement	7.18 MWRI & Sector / Department	7.19 Project Description + Other Related Information
7.20 Conducting EIA study	7.21 Sector / Department + MWRI Institutes or external consultants	—
7.22 Submitting EIA Reports (EIS)	7.23 Sector / Department	7.24 3 copies of form A, B or the Full EIA report
7.25 Review and Opinions on EIA Reports	7.26 MWRI & EEAA	7.27 EIA Review Guidelines
7.28 Decision – making	7.29 MWRI & EEAA	7.30 EIS + Review report + Recommendations
7.31 Project Implementation	7.32 Sector / Department	7.33 Based on EIS + Review Report + Recommendations
7.34 Follow-up	7.35 Sector /	7.36 EIS + Review

activities (Monitoring and Post Audits)	Department	Report + Recommendations
7.37 Record Keeping and Reporting (Environmental Register)	7.38 Sector / Department	7.39 EEAA Environmental Register forms
7.40 Feed back for Corrective Actions	7.41 Sector / Department / MWRI	7.42 EIS + Review report + Monitoring/Audit Results

4.2 EIAs for Projects proposed by External Developers

As a CAA, the Ministry will be responsible for carrying out the following activities:

- Identify projects, which are subject to categories. A, B and C based on EIA guidelines.
- Decide on site suitability of projects in consultation with EEAA.
- Acquaint proponents with EIA screening forms (for categories A & B) or sectoral guidelines (for category C) and ensure that EIA studies are comprehensive and informative.
- Ensure the conformity and adequacy of the information presented by proponents.
- Review all documents presented by proponents (screening forms, scoped and full EIAs), formulate an opinion and send documents to EEAA for further technical evaluation.
- Formulate the opinions and recommendations of EEAA and inform the proponent officially by registered mail.
- Conduct follow-up activities to ensure that proponents are implementing their projects according to the reviewed EIS.

7.42.1.1.1.1

T

able (4.2) The Ministry's Role as a CAA

7.43 EIA Process	7.44 Responsible Entity	7.45 Supporting or Required Documents
7.46 Initiation of the Project Proposals	Proponent	—
7.47 Screening (EIA is needed? What class?)	7.48 MWRI	7.49 Project Lists (A, B, C)
7.50 EIA Initiation	Proponent	—
7.51 Public Consultation /Involvement	7.52 Main Stakeholder	7.53 Project Description + Other related Information
7.54 Conducting EIA study	7.54.1.1.1.1.1 Proponent	—
7.55 Submitting EIA Reports (EIS)	Proponent	—
7.56 Review and Opinions on EIA Reports	7.57 MWRI & EEAA	7.58 EIA review Guidelines
7.59 Decision –making	7.60 MWRI & EEAA	7.61 EIS + Review report + Recommendations
7.62 Project Implementation	Proponent	—
7.63 Follow-up activities 1. Preoperational License 2. Monitoring 3. Audits	7.64 MWRI (prior to issuing operation license) 1. MWRI	7.65 EIS + Review report + Recommendations

	2. Proponent 3. EEAA	
7.66 Record Keeping and Reporting (Environmental Register)	Proponent	—
7.67 Feed back for Corrective Actions	—	—

4.3 The Public Involvement

The public involvement is an integral part of the EIA process. It aims to obtain the views of, and to inform, the locals and other interest groups or entities that may be directly or indirectly affected by the project. Accordingly, it has to take place during the project planning and after the preparation of the EIS in order to incorporate the public’s comments in the decision making process. The public are all the stakeholders influenced by the proposed development. They include the locals, neighboring communities as well as all the concerned governmental entities. These entities include the CAA, governorate at which the project is taking place, and the ministries engaged in activities at the development area.

4.4 Decision Making in the EIA Process

One of the primary goals of impact assessment is to improve the decision-making process by which projects are planned, designed and implemented. The various phases of the impact assessment process have their own decision-making requirements. These phases are known as the “scoping process” and the “impact evaluation and free decision”.

The scoping process consists of the early identification of environmental issues and concerns likely to be significant, toward which the assessment should be directed. The advantage of this process is minimizing inefficiencies and directing maximum effort to the analysis of matters of real consequences. A possible disadvantage is that the process can set narrow constraints on assessment efforts and thereby increase the likelihood of oversight of unforeseen issues. Therefore, this process should be conducted by the multidisciplinary EIA team, external experts, concerned stakeholders and the public to ensure that all views and concerns are addressed.

Having identified possible impacts of project development, evaluating those impacts with respect to their significance becomes necessary. The impact evaluation process is the most critical since it informs the decision makers of the issues to which they should pay special attention. Impacts can be defined as consequences of the proposed actions. Any one impact of project development may represent simultaneously any number of beneficial and adverse attributes. The criteria that could be used in determination of impact significance include, but not restricted to the following;

1. Probability of occurrence
2. Magnitude
3. Extent
4. Duration
5. Reversibility
6. Relevance to legal mandate

7. Social distribution of risks and benefits

Decisions will thus be made based on the results of technical, economic and environmental studies, however, there is usually one “final decision” which determines whether the project is to be implemented. The three decisions that could be made are whether the project proceeds, proceeds with amendments, or is cancelled or postponed.

If the project is postponed or cancelled then the EIA work is finished, only becoming relevant when a postponed project is implemented at a later date. If the EIA proceeds then the EIA activities of monitoring and auditing may be implemented, and their results are fed back for further enhancement of the environmental performance of the project.

ANNEX A

TABLE (A.1) CLASSIFICATION OF PROJECTS UNDERTAKEN BY THE MWRI

White (A) List Projects	Grey (B) List Projects	Black (C) List Projects
<i>1. New Irrigation Projects</i>		
<ul style="list-style-type: none"> - Service projects such as bridges and channel access roads on secondary or tertiary canals - Construction of pump stations which are not used for pumping any kind of wastewater 	<ul style="list-style-type: none"> - Horizontal expansion projects in non-sensitive areas* with an area of 1000 feddans or less - Construction of water conveyance systems (canals or pipes) with a length of 50km or less in environmentally insensitive areas*, which shall not be supplied by any kind of drainage or wastewater. - Service projects such as bridges and channel access roads on main canals - Hydraulic structures such as gates (manual and/or automatic), barrages, weirs, diversions, siphons, escapes on secondary or tertiary canals - Community development and housing projects for a population of 1000 persons or less in environmentally insensitive areas* 	<ul style="list-style-type: none"> - Horizontal expansion projects in sensitive areas* - Horizontal expansion projects with an area more than 1000 feddans - Horizontal expansion projects utilizing reused water - Construction of water conveyance systems (canals, pipes, aqueducts) with a length of more than 50km - Construction of water conveyance systems (canals or pipes) of any length in environmentally sensitive areas* - Construction of water conveyance systems (canals, pipes, aqueducts) of any length and in any location, if these systems are supplied with any type of wastewater. - Construction of pump stations which are used for pumping or mixing of any kind of wastewater - Hydraulic structures such as gates (manual and/or automatic), barrages, weirs, diversions, siphons, escapes on the Nile or on main canals

	<ul style="list-style-type: none">- Groundwater extractions 500m³/day or less	<ul style="list-style-type: none">- Service projects such as bridges and channel access roads on the Nile- Community development and housing projects in environmentally sensitive areas*- Community development and housing projects for a population of more than 1000 persons in any area- Groundwater extractions of more than 500m³/day
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TABLE (A.1) CLASSIFICATION OF PROJECTS UNDERTAKEN BY THE MWRI, CONT.

White (A) List Projects	Grey (B) List Projects	Black (C) List Projects
2. Irrigation Improvement Projects		
<ul style="list-style-type: none"> - Expansions or modifications of the existing canals by 10% or less in insensitive areas * - Irrigation improvement on the field level such as replacement of traditional ‘mesquas’ by buried pipes - Pump stations for fresh water with an operating power of less than 100 HP. - Maintenance of hydraulic structures - Lining of secondary canals or less - Maintenance of secondary canals or less - Rehabilitation and renovation of existing pump stations 	<ul style="list-style-type: none"> - Expansions or modifications of the existing canals by more than 10% - New hydraulic structures on secondary canals or less - Replacement of hydraulic structures such as aqueducts, regulators, bridges - New pump stations for fresh water with an operating power between 100 HP and 1000 HP - Lining of main canals - Maintenance of main canals 	<ul style="list-style-type: none"> - Change of the irrigation concept (such as change from supply-based to demand-based irrigation) - New hydraulic structures on main canals or the Nile - New pump stations for fresh water with an operating power of more than 1000 HP - River banks protection and development projects

TABLE (A.1) CLASSIFICATION OF PROJECTS UNDERTAKEN BY THE MWRI, CONT.

White (A) List Projects	Grey (B) List Projects	Black (C) List Projects
3. Drainage Projects		
<ul style="list-style-type: none"> - Construction of a tile drainage system for an area of 100 feddans or less 	<ul style="list-style-type: none"> - Construction of a tile drainage system for an area between 100 feddans and 1000 feddans - Construction of new secondary or tertiary open drains not likely to receive municipal or industrial wastewater - Agricultural drainage water reuse projects 	<ul style="list-style-type: none"> - Construction of a tile drainage system for an area of more than 1000 feddans - Construction of new main open drains - Construction of secondary open drains likely to receive municipal or industrial wastewater - Municipal wastewater reuse projects - Industrial wastewater reuse projects
4. Dams, Barrages, Reservoirs and Flood Control Projects		
<ul style="list-style-type: none"> - Rehabilitation of existing hydraulic structures 	<ul style="list-style-type: none"> - Flash flood utilization projects in non-sensitive areas 	<ul style="list-style-type: none"> - Flash flood utilization projects in sensitive areas - Construction of new hydraulic structures (barrages, locks, ...) on the Nile
5. Shore Protection Projects		

	<ul style="list-style-type: none">- Rehabilitation of existing shore protection works- Modification or extension of existing shore protection works by 10% or less	<ul style="list-style-type: none">- Modification or extension of existing shore protection works by more than 10%- Construction of new shore protection works
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* Sensitive areas are defined, in the *EEAA Guidelines for Egyptian EIA*, as the Nile banks, and its two branches and big canals, touristic and historic areas, overpopulated areas, sea or lake shores or natural reserves.



ANNEX B

7.68 Table (B.1) Potential Impacts of New Irrigation Projects and their Mitigation Measures (Surface Water, Groundwater, Re-used Water)

Environmental Element	7.68.1 Potential Negative Impacts	7.68.2 Mitigation Measures
		(Project Implementation Phase)
7.68.2.1.1.1.1 Terrestrial		

<p>Land / Soil Quality</p>	<ul style="list-style-type: none"> • Over-irrigation effects on soil: <ul style="list-style-type: none"> - Water logging - Salinization and leaching • Soil salinization in case of using saline water (e.g. groundwater) <hr/> <ul style="list-style-type: none"> • Soil erosion <hr/> <ul style="list-style-type: none"> • Soil pollution in case of re-using wastewater <hr/> <ul style="list-style-type: none"> • Land subsidence due to over tapping (in case of groundwater) 	<ul style="list-style-type: none"> • Regulation of water application to avoid over-watering (O/M) • Leaching of soils by flushing soils periodically (O/M) • Cultivation of crops with salinity tolerance (D) • Provide of drainage system if not existing (D) • Maintenance of existing drainage system (O/M) <hr/> <ul style="list-style-type: none"> • Design of sprinkler system minimizing erosion hazard assuring infiltration rate exceeds sprinkler application rates (D) <hr/> <ul style="list-style-type: none"> • Treat water before usage (D) <hr/> <ul style="list-style-type: none"> • Control rate of tapping (O/M)
<p>Fauna / Flora</p>	<ul style="list-style-type: none"> • Encroachment on ecologically sensitive areas • Alteration and destruction of wildlife habitat or impediment on movement of wildlife 	<ul style="list-style-type: none"> • Siting of projects to avoid encroachment on sensitive areas (D) • Establishment of compensatory parks (D) • Animal rescue and relocation (O/M) • Provision of corridors for movement (D)

7.69

7.70D: Design

C: Construction

O: Operation

M: Management

7.71 Table (B.1) Potential Impacts of New Irrigation Projects and their Mitigation Measures, cont.

Environmental Element	7.71.1 Potential Negative Impacts	7.71.2 Mitigation Measures 7.71.3 (Project Implementation Phase)
7.71.3.1.1.1		Aquatic
Hydrology / Flow Pattern	<ul style="list-style-type: none"> • Scouring of canals <hr/> • Diverting river water can result in change in hydrology and limnology of river basin <hr/> • Raising of water table (in case of absence / inadequate drainage system) <hr/> • Lowering of water table (in case of over tapping) 	<ul style="list-style-type: none"> • Design of canal system to minimize risk and use lined canals (D) <hr/> • Control rate of water diversion (D) <hr/> • Provide adequate drainage system (D) <hr/> • Consider canal lining (D) <hr/> • Control rate of tapping (O/M)

Surface Water Quality	<ul style="list-style-type: none"> Reduction in quality due to leaching of nutrients and agrochemicals from soils 	<ul style="list-style-type: none"> Improved agricultural practices and control of inputs (particularly biocides and chemical fertilizers) (O/M) Improved water management (O/M) Imposition of water quality criteria (O/M)
	<ul style="list-style-type: none"> Reduction in river flow decreases dilution of municipal and industrial waste leading to increase in pollution 	<ul style="list-style-type: none"> Relocation or redesign of project (D) Control pollution sources (O/M)
Groundwater	<ul style="list-style-type: none"> Reduction in quality from agricultural biocides 	<ul style="list-style-type: none"> Improved agricultural practices and control of inputs (O/M)
	<ul style="list-style-type: none"> Over tapping depletes aquifers 	<ul style="list-style-type: none"> Limitation of withdrawal so that it does not exceed “safe yield” (recharge rate) (D)
	<ul style="list-style-type: none"> Over tapping of groundwater may lead to reduction in water quality due to salt water intrusion (in coastal areas) 	<ul style="list-style-type: none"> Reduction of takeoff to maintain adequate downstream flow (O/M) Recharge of aquifers through injection wells (D)
Fauna / Flora	<ul style="list-style-type: none"> Alteration or loss of flood plain vegetation and disturbance of coastal ecology 	<ul style="list-style-type: none"> Siting of project to less vulnerable area (D) Limitation and regulation of water taken off to minimize problems (D)

7.72D: Design

C: Construction

O: Operation

M: Management

Table (B.1) Potential Impacts of New Irrigation Projects and their Mitigation Measures, cont.

Environmental Element	7.72.1 Potential Negative Impacts	7.72.2 Mitigation Measures (Project Implementation Phase)
7.72.2.1.1.1		Air
Air Quality	<ul style="list-style-type: none"> • Increased humidity creating favorable habitat for insect disease vectors <hr/> <ul style="list-style-type: none"> • Emissions from pumping stations 	<ul style="list-style-type: none"> • Vector control (O/M) <hr/> <ul style="list-style-type: none"> • Install emission control devices (D)

7.72.2.1.1.2		Human Interface
Socio-economic	<ul style="list-style-type: none"> • Reduction in river base flow reduces water supply for downstream users <hr/> <ul style="list-style-type: none"> • Groundwater tapping for irrigation may effect drinking water supply <hr/> <ul style="list-style-type: none"> • Conflicts over water supply and inequalities in water distribution throughout service area <hr/> <ul style="list-style-type: none"> • Threat to historic, cultural or aesthetic features <hr/> <ul style="list-style-type: none"> • Dislocation of population and communities <hr/> <ul style="list-style-type: none"> • Changes in demographic / ethnic composition 	<ul style="list-style-type: none"> • Control rate of water diversion (D) <hr/> <ul style="list-style-type: none"> • Control rate of withdrawal (O/M) <hr/> <ul style="list-style-type: none"> • Measures to control equitable distribution among users and monitor to assure adherence (D & O/M) <hr/> <ul style="list-style-type: none"> • Siting of project to prevent loss (D) • Salvage or protection of cultural sites (O/M) <hr/> <ul style="list-style-type: none"> • Siting of project to minimize effect (D) <hr/> <ul style="list-style-type: none"> • Resettlement scheme ensuring at least equal standard of living (D)

Health	<ul style="list-style-type: none"> • Introduction or increase in incidence of water-borne or water-related disease 	<ul style="list-style-type: none"> • Prevention measures; used lined canals or pipes to discourage vectors, avoid stagnant or slow moving water, use straight or slightly curving canals, disease prophylaxis, disease treatment (D & O/M)
	<ul style="list-style-type: none"> • Increased salinity and pollution effects on drinking water supply 	<ul style="list-style-type: none"> • Establishment and enforcement of quality standards (O/M)

7.73D: Design

C: Construction

O: Operation

M: Management

7.74 Table (B.2) Potential Impacts of Irrigation Improvement Projects and their Mitigation Measures

Environmental Element	7.74.1 Potential Negative Impacts	7.74.2 Mitigation Measures (Project Implementation Phase)
7.74.2.1.1.1		Terrestrial
Land / Soil Quality	<ul style="list-style-type: none"> • Over-irrigation in case of continuous irrigation may cause: <ul style="list-style-type: none"> - Water logging - Salinization and leaching - Decrease in crop productivity (due to loss of essential nutrients and organic matter) 	<ul style="list-style-type: none"> • Avoid over-watering (O/M) • Set-up or adjust irrigation management infrastructure (D & O/M) • Analyze soils and monitor changes so that potential problems can be managed (O/M) • Replacement of nutrients by fertilizers or crop rotation (D)
Fauna / Flora	<ul style="list-style-type: none"> • Dumping of dredged material on canal banks attracts rodents and mosquitoes 	<ul style="list-style-type: none"> • Removal and proper disposal of dredged material away from the canal (O/M)

7.74.2.1.1.2		Aquatic
Hydrology / Flow Pattern	<ul style="list-style-type: none"> • Scouring of canals 	<ul style="list-style-type: none"> • Design of canal system to minimize risk and use of lines canals (D)
	<ul style="list-style-type: none"> • Diverting river water can result in change in hydrology and limnology of river basin 	<ul style="list-style-type: none"> • Control rate of water diversion (D)
Surface Water Quality	<ul style="list-style-type: none"> • Reduction in river flow may decrease dilution leading to increased pollution 	<ul style="list-style-type: none"> • Control rate of water diversion (D) • Control pollution load (D)
Groundwater	<ul style="list-style-type: none"> • Reduction in quality and quantity due to salt water intrusion 	<ul style="list-style-type: none"> • Reduction of takeoff to maintain adequate downstream flow (D) • Recharge of coastal aquifers through injection wells (D)
Fauna / Flora	<ul style="list-style-type: none"> • Dredging may disturb the canal bed environment including fauna, flora and ecological balance 	<ul style="list-style-type: none"> • Design canal for non-silting condition to reduce maintenance requirements (D) • Consider biological aquatic weed combating (O/M) • Prevent dumping of solid waste into canals (O/M)

7.75

7.76D: Design

C: Construction

O: Operation

M: Management

7.77 Table (B.2) Potential Impacts of Irrigation Improvement Projects and their Mitigation Measures, cont.

Environmental Element	7.77.1 Potential Negative Impacts	7.77.2 Mitigation Measures (Project Implementation Phase)
7.77.2.1.1.1		Air
Air Quality	<ul style="list-style-type: none"> Air pollution from emission of dredgers and pumping station 	<ul style="list-style-type: none"> Install emission control devices (D)
7.77.2.1.1.2		Human Interface
Socio-economic	<ul style="list-style-type: none"> Dislocation of population and communities 	<ul style="list-style-type: none"> Siting of project to minimize effect (D) Resettlement scheme ensuring at least equal standard of living (D)
Health	<ul style="list-style-type: none"> Health problems from breeding of insect disease vectors on disposed dredged material 	<ul style="list-style-type: none"> Removal and proper disposal of dredged material (O/M)

7.78D: Design

C: Construction

O: Operation

M: Management

Table (B.3) Potential Impacts of Drainage (Open / Subsurface) Projects and their Mitigation Measures

Environmental Element	7.78.1 Potential Negative Impacts	7.78.2 Mitigation Measures (Project Implementation Phase)
7.78.2.1.1.1		Terrestrial
Land / Soil Quality	<ul style="list-style-type: none"> • Inadequate drainage effects on soil: <ul style="list-style-type: none"> - Water logging - Salinization and leaching • Sediments in return flows would enrich the irrigated soils downstream if mixed with irrigation water • Mixing of return flow with irrigation water reduces water quality and increases soil pollution 	<ul style="list-style-type: none"> • Installation and maintenance of adequate drainage system (D) • Use lined drains or pipes to prevent seepage (D) • Design and management of drains to minimize sedimentation (D & O/M) • Control mixing rates (D) • Monitor water quality before and after mixing (O/M)
Fauna / Flora	<ul style="list-style-type: none"> • Habitat Fragmentation 	<ul style="list-style-type: none"> • Provision of passageways (D)

7.78.2.1.1.2		Aquatic
Hydrology / Flow Pattern	<ul style="list-style-type: none"> • Clogging of canals by sediments • Clogging of drains by weeds 	<ul style="list-style-type: none"> • Measures to minimize erosion in fields (D) • Design and management of drains to minimize sedimentation and weed growth (D & O/M)
Surface Water Quality	<ul style="list-style-type: none"> • Reduction in quality due to leaching of nutrients and agrochemicals from soils • Reduction in quality due to dumping of solid waste in drains 	<ul style="list-style-type: none"> • Improved agricultural practices and control of inputs (particularly biocides and chemical fertilizers) (D & O/M) • Cover drains along solid waste sensitive stretches (D)
Groundwater Quality	<ul style="list-style-type: none"> • Reduction in quality from agricultural biocides • Increase in height of water table due to poor drainage increases level of soil salinity 	<ul style="list-style-type: none"> • Reduction of input to and release of nutrients (nitrogen and phosphorus) from fields (O/M) • Use lined drains or pipes to prevent seepage (D)
Fauna / Flora	<ul style="list-style-type: none"> • Algal bloom and weed proliferation due to increase in nutrient level • Effect on fisheries due to deterioration in river water quality 	<ul style="list-style-type: none"> • Reduction of input to and release of nutrients (nitrogen and phosphorus) from fields (O/M) • Improved water management (O/M) • Imposition of water quality criteria (O/M)

Table (B.3) Potential Impacts of Drainage (Open / Subsurface) Projects and their Mitigation Measures, cont.

Environmental Element	7.78.3 Potential Negative Impacts	7.78.4 Mitigation Measures (Project Implementation Phase)
7.78.4.1.1.1		Air
Air Quality	<ul style="list-style-type: none"> • Stagnant water in open drains releases unpleasant gases such as hydrogen sulphide and methane 	<ul style="list-style-type: none"> • Avoid creation of anaerobic environment (O/M)
7.78.4.1.1.2		Human Interface
Socio-economic	<ul style="list-style-type: none"> • Threat to historic, cultural or aesthetic features 	<ul style="list-style-type: none"> • Siting of project to prevent loss (D) • Salvage or protection of cultural sites (D)

Health	<ul style="list-style-type: none"> • Introduction or increase in incidence of water-borne or water-related disease 	<ul style="list-style-type: none"> • Prevention measures; used lined canals or pipes to discourage vectors, avoid stagnant or slow moving water, use straight or slightly curving canals, disease prophylaxis, disease treatment (D & O/M)
	<ul style="list-style-type: none"> • Disease and health problems from reuse of wastewater in irrigation 	<ul style="list-style-type: none"> • Wastewater treatment prior to use (D & O/M) • Establishment and enforcement of standards for wastewater use (O/M)

7.79D: Design

C: Construction

O: Operation

M: Management

Table (B.4a) Potential Impacts of Dams, Barrages and Reservoirs (Construction) and their Mitigation Measures

Environmental Element	7.79.1 Potential Negative Impacts	7.79.2 Mitigation Measures (Project Implementation Phase)
7.79.2.1.1.1		Terrestrial
Land / Soil Quality	<ul style="list-style-type: none"> • Soil erosion 	<ul style="list-style-type: none"> • Precautions to minimize erosion (C/M)
Fauna / Flora	<ul style="list-style-type: none"> • Destruction of vegetation 	<ul style="list-style-type: none"> • Land reclamation (C/M)
7.79.2.1.1.1.1 Aquatic		
Hydrology / Flow Pattern	<ul style="list-style-type: none"> • Diversion of water causes changes in flow pattern 	<ul style="list-style-type: none"> • Control water diversion (D)
Surface Water Quality	<ul style="list-style-type: none"> • Pollution from construction and waste disposal 	<ul style="list-style-type: none"> • Water pollution control and proper disposal of waste (C/M)
Groundwater	<ul style="list-style-type: none"> • Elevation of water table in the area 	<ul style="list-style-type: none"> • Provide drainage facilities to low ground water table (D)
Fauna /Flora	<ul style="list-style-type: none"> • Alteration of biodiversity 	<ul style="list-style-type: none"> • Create substitute habitat to achieve no head loss (D)
7.79.2.1.1.1.2 Air		
Air Quality	<ul style="list-style-type: none"> • Pollution from construction emissions and waste disposal 	<ul style="list-style-type: none"> • Air pollution control (C/M)

7.79.2.1.1.1.1.3 Human Interface		
Socio-economic	<ul style="list-style-type: none"> Influx of workers and the associated social, infrastructural impacts 	<ul style="list-style-type: none"> Careful location of camps, buildings, borrow pits, quarries, spoil and disposal sites (D)
Health	<ul style="list-style-type: none"> Sanitary and health problems from construction camps 	<ul style="list-style-type: none"> Provide proper sanitation to the construction camp (D & C/M)

7.80D: Design

C: Construction

O: Operation

M: Management

Table (B.4 b) Potential Impacts of Dams, Barrages and Reservoirs (Operation) and their Mitigation Measures

Environmental Element	7.80.1.1 Potential Negative Impacts	7.80.1.2 Mitigation Measures (Project Implementation Phase)
7.80.1.2.1.1.1.1.1	Terrestrial	
Land / Soil Quality	<ul style="list-style-type: none"> • Salinization of floodplain lands • Reduction in sediment yield results in land advancement of shoreline 	<ul style="list-style-type: none"> • Regulation of flow to minimize effect (O/M) • Provide shore protection measures
Fauna / Flora	<ul style="list-style-type: none"> • Downstream effects on traditional cultivation (reduced flood delivery of nutrients) • Loss of lands and wildlife habitat 	<ul style="list-style-type: none"> • Increased fertilizer use on agricultural fields to compensate for loss of fertility (D & O/M) • Siting of structure to avoid or minimize loss, establish compensatory park, animal rescue and relocation (D)

7.80.1.2.1.1.1.1.2 Aquatic		
Hydrology / Flow Pattern	<ul style="list-style-type: none"> • Water loss to evaporation 	<ul style="list-style-type: none"> • Optimize water management to minimize evaporation (O/M)
	<ul style="list-style-type: none"> • Formation of sediment deposits at reservoir entrance creating backwater effect and flooding and water logging upstream 	<ul style="list-style-type: none"> • Sediment flushing, sluicing (O/M)
	<ul style="list-style-type: none"> • Sedimentation of reservoir and loss of storage capacity 	<ul style="list-style-type: none"> • Hydraulic removal of sediments (flushing, sluicing, release of density currents) (O/M)
	<ul style="list-style-type: none"> • Scouring of river bed below dam 	<ul style="list-style-type: none"> • Design of trap efficiency and sediment release to increase salt content of released water (D)
Surface Water Quality	<ul style="list-style-type: none"> • Deterioration of water quality in reservoir 	<ul style="list-style-type: none"> • Control of land uses, wastewater discharges, and agricultural chemical use in watershed (O/M) • Limit retention time of water in reservoir (O/M) • Provision of multi-level releases to avoid discharge of anoxic water (D)

7.81

7.82D: Design

C: Construction

O: Operation

M: Management

Table (B.4 b) Potential Impacts of Dams, Barrages and Reservoirs (Operation) and their Mitigation Measures, cont.

Environmental Element	7.82.1.1 Potential Negative Impacts	7.82.1.2 Mitigation Measures (Project Implementation Phase)
7.82.1.2.1.1.1.1 Aquatic		
Groundwater	<ul style="list-style-type: none"> Altered level of water table causing deterioration in water quality and salt water intrusion in estuary and upstream 	<ul style="list-style-type: none"> Maintenance of at least minimum flow to prevent intrusion (O/M)
Fauna /Flora	<ul style="list-style-type: none"> Proliferation of aquatic weeds in reservoirs impairing dam discharge 	<ul style="list-style-type: none"> Provide weed control measures, regulation of water discharge and manipulation of water levels to discourage weed growth (D & O/M)
	<ul style="list-style-type: none"> Disruption of riverine fisheries due to changes in flow, blocking of migration and changes in water quality and limnology 	<p>Maintenance of at least minimum flow for fisheries, provision of fish ladders and other means of passage, provide protection for spawning grounds (D & O/M)</p>
	<ul style="list-style-type: none"> Fish destruction in turbines and pumps 	<ul style="list-style-type: none"> Install screens upstream pumps (D)
7.82.1.2.1.1.1.2 Air		
Air Quality	<ul style="list-style-type: none"> Increase in humidity and fog creating favorable habitat for insect disease vectors (mosquitoes, 	<ul style="list-style-type: none"> Vector control (O/M)

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7.83

7.84D: Design

C: Construction

O: Operation

M: Management

Table (B.4 b) Potential Impacts of Dams, Barrages and Reservoirs (Operation) and their Mitigation Measures, cont.

Environmental Element	7.84.1.1 Potential Negative Impacts	7.84.1.2 Mitigation Measures (Project Implementation Phase)
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7.84.1.2.1.1.1.1.1 Human Interface
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Socio-economic	<ul style="list-style-type: none"> • Dislocation of people living in inundation zone 	<ul style="list-style-type: none"> • Relocation of people to suitable area, provision of compensation in kind or resources lost, provision of adequate health services, infrastructures and employment opportunities (D & O/M)
	<ul style="list-style-type: none"> • Disruption / destruction of tribal / indigenous groups 	<ul style="list-style-type: none"> • Avoid dislocation of unacculturated people, if not possible relocate in area allowing them to retain lifestyle and customs (D)
	<ul style="list-style-type: none"> • Loss of land by inundation to form reservoir 	<ul style="list-style-type: none"> • Siting of dam to decrease losses, decrease size of dam or reservoir, protect equal areas in region to offset losses (D)
	<ul style="list-style-type: none"> • Loss of historic, cultural or aesthetic features by inundation 	<ul style="list-style-type: none"> • Siting of dam or decrease of reservoir size to avoid loss, salvage or protection of cultural properties (D)
	<ul style="list-style-type: none"> • Conflicting demands for water use 	<ul style="list-style-type: none"> • Planning and management of dam in context of regional development plans, equitable allocations of water between large and small holders and between geographic regions of valley (D)
	<ul style="list-style-type: none"> • Social disruption and decrease in standard of living of resettled people 	<ul style="list-style-type: none"> • Maintenance of standard of living by ensuring access to resources at least equaling those lost, provision of health and social services (D)
		<i>October</i>

Health	• Increase in water related diseases	• Design and operation of dam to decrease habitat for vector, vector control, disease prophylaxis and treatment (D & O/M)
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D: Design

C: Construction

O: Operation

M: Management

Table (B.4 c) Potential Impacts of Flash Flood Protection Projects and their Mitigation Measures

Environmental Element	7.84.2 Potential Negative Impacts	7.84.3 Mitigation Measures (Project Implementation Phase)
7.84.3.1.1.1.1.1 Terrestrial		
Fauna / Flora	<ul style="list-style-type: none"> • Reduction in the flood plain grazing through ecological changes on the floodplain <hr/> • Impact on vegetation <hr/> • Obstacles to wildlife passage 	<ul style="list-style-type: none"> • Production of fodder crops and usage of byproducts of irrigated food crops and development of alternative water sources (D) <hr/> • Integration of existing rangeland use with planned development (D) <hr/> • Construction of bridges or special crossing places (D)
7.84.3.1.1.2 Aquatic		
Hydrology / Flow Pattern	<ul style="list-style-type: none"> • Alternation of natural flow pattern 	<ul style="list-style-type: none"> • Protection of natural overflow areas and creation of overflow basins (D)

Surface Water Quality	<ul style="list-style-type: none"> Degradation of impounded water quality 	<ul style="list-style-type: none"> Consider water quality aspects in the design (D)
Groundwater		
Fauna / Flora	<ul style="list-style-type: none"> Adverse effects on fisheries and other aquatic resources by alternation of water quality. 	<ul style="list-style-type: none"> Protection of reproductive site for fish, incorporation of fishery management (D)
7.84.3.1.1.3		Human Interface
Socio-economic	<ul style="list-style-type: none"> Potential for structural failure of control structures leading to increased risk of life and property 	<ul style="list-style-type: none"> Implementation of non-structural measures to prevent increased flood risk (O/M)
Health	<ul style="list-style-type: none"> Introduction of water-borne diseases 	<ul style="list-style-type: none"> Disease prophylaxis and treatment (O/M)

7.85

7.86D: Design

C: Construction

O: Operation

M: Management

Table (B.5) Potential Impacts of Shore Protection Projects and their Mitigation Measures

Environmental Element	7.86.1 Potential Negative Impacts	7.86.2 Mitigation Measures (Project Implementation Phase)
7.86.2.1.1.1.1 Terrestrial		
Land / Soil Quality	<ul style="list-style-type: none"> Impacts of structures on the shoreline resulting from changed sediment transport patterns 	<ul style="list-style-type: none"> Construct Sediment and erosion control structures (D/M)
Fauna / Flora	<ul style="list-style-type: none"> Changes in habitat due to the construction of shore protection structures 	<ul style="list-style-type: none"> Compensatory restocking of species and provision of new appropriate habitat (O/M) Compensatory planting and revegetation (O/M)
7.86.2.1.1.1.2 Aquatic		
Hydrology / Flow Pattern	<ul style="list-style-type: none"> Impacts on coastal landforms (including estuaries and river mouths), coastal and estuarine hydrodynamics 	<ul style="list-style-type: none"> Proper selection of design and layout (D/M)

<p>Surface Water Quality</p>	<ul style="list-style-type: none"> • Water quality degradation as a result of construction activities. • Coastal structures may result in siltation and salinization • Change in water movement patterns, and sediment transport processes 	<ul style="list-style-type: none"> • Apply proper construction management practices (M) • Controls to compensate for poor flushing (M) • Spill prevention and leakage prevention precautions (M) • Procedures for solid and liquid wastes (M / O) • Sediment controls such as sediment traps and sit curtains (D/M)
<p>Groundwater Quality</p>	<ul style="list-style-type: none"> • Alteration of groundwater regime • Salty water intrusion 	<ul style="list-style-type: none"> • Reduction of takeoff, where applicable (/M) • Recharge of aquifers through injection wells (D)
<p>Fauna / Flora</p>	<ul style="list-style-type: none"> • Impacts on fauna and flora through removal by clearing or dredging, sedimentation, access to light, induced bank collapse, a change in substrata, effects of boat wash, changes in water quantity or quality, • Potential re-colonization of some sensitive species or communities due to the disturbance. 	<ul style="list-style-type: none"> • Mitigation proposals such as Compensatory restocking of species and provision of new appropriate habitat, opportunities for colonization.(O/M) • Identify potential weed, and introduced species to control and prevent infestations at the site and spread into adjacent localities. (O/M) • Minimize dredge and fill operations (C/M)

7.87D: Design

C: Construction

O: Operation

M: Management

Table (B.5) Potential Impacts of Shore Protection Projects and their Mitigation Measures, cont.

Environmental Element	7.87.1 Potential Negative Impacts	7.87.2 Mitigation Measures (Project Implementation Phase)
<i>7.87.2.1.1.1.1 Air</i>		
Air Quality	<ul style="list-style-type: none"> Air quality degradation due to emissions and deposition rates 	<ul style="list-style-type: none"> Apply proper construction management practices (M)
<i>Human Interface</i>		
Socio-economic	<ul style="list-style-type: none"> Economic impacts on other industries both within the immediate locality and the wider community, such as tourist facilities, agriculture, aquaculture, commercial fishing and boat building. Potential impacts on land values and loss of access to public land and waterways 	<ul style="list-style-type: none"> Proper choice of design, layout and location can minimize impacts on neighboring community (D) Construction should take place at night to minimize impacts on traffic. (M) Public involvement and compensation (M)
Health	<ul style="list-style-type: none"> Sanitary and health problems from construction camps. 	<ul style="list-style-type: none"> The application of adequate management practices during the construction and operation phases is anticipated to mitigate the sanitary and health problems. (M)

7.88D: Design

C: Construction

O: Operation

M: Management

ANNEX C

Arab Republic Egypt
The Cabinet of Ministers
Egyptian Environmental Affairs Agency (EEAA)

القاهرة
القاهرة
القاهرة

الهيئة العامة
Environmental Screening Form (A)

معلومات عامة

(General information)

.....

(Project Title)

.....

(Residential, Commercial, Touristic, Industrial, Others) (Type of Project)

.....

(Project developer/ applicant)

.....

(Name of Owner & Contact Person)

.....

(Address)

.....

(Fax. No.)

(Telephone. No)

.....

(Estimated capital investment/ L.E.)

.....

(Competent licensing authority)

.....

(New project or extension of existing project)

.....

(project phases and expected starting date)

.....

----- ???? ? ?

I.D No./ passport No.

????-----

Reference

F????-----

Date

ANNEX D

??????μ ? ??????

??????B ?? ?? ?

?????? ???

Arab Republic of Egypt

The Cabinet of Ministries

Egyptian Environmental Affairs Agency (EEAA)

? ????? ?μ T?? ????

Environmental Screening Form (B)

? ? ???? (General Information)

7.88.1.1.1 ????????

(Project Title)

??? - ? ?? - ??? - ??? - ?? ??????

(Residential, Commercial, Toursistic, Industrial, Others) (Type of project)

- ? μ ????? ?H??

(Investor/applicable)

? μ ????? ?? ??? ???? ? ? ?

(Project developer or/applicable)

T?

(reference)

????

(Address)

???????

Phone No.)

??????

(Fax No.)

?

1.1.1 Information
to be completed by the EEAA officials

???

1

ate Date of applicable

-
- የጠቅላይ ልማት ግብይት ጠቅላይ ልማት ግብይት
(Estimated Capital Investment, L.E)

7.88.1.1.1.1.1 - የግብይት ግብይት ግብይት ግብይት

Competent Licensing Authority & Address)

- የግብይት ግብይት ግብይት ግብይት
(New /Extension)
- የግብይት ግብይት ግብይት ግብይት
(Project phases and expected starting dates)
- የግብይት ግብይት ግብይት ግብይት
(Construction)
- የግብይት ግብይት ግብይት ግብይት
(Operation)
- የግብይት ግብይት ግብይት ግብይት
(Future Extension)
- የግብይት ግብይት ግብይት ግብይት (Brief Project description)
 - የግብይት ግብይት ግብይት ግብይት
(Projected basic features)
 - የግብይት ግብይት ግብይት ግብይት
(Objectives)
 - የግብይት ግብይት ግብይት ግብይት
(Need for Justification)

7.88.1.1.1.1.1 - የግብይት ግብይት ግብይት ግብይት

(Basic components)

- **Technological systems (Accompanied as much as possible with layout and operational charts and diagrams showing inputs and outputs (including wastes))**

-5 Alternatives (alternatives considered)

(alternatives considered)

- **Sites (sites)**
- **Technologies (technologies)**
- **Designs (designs)**
- **Materials (materials)**
- **Similar projects (are there available studies of similar projects: indicate source)**

(are there available studies of similar projects: indicate source)

- Project location and site

- **Address (Address)**

- **Total Area, m² (Total Area, m²)**

Please attach a detailed map with a suitable scale to indicate clearly the site, transportation routes and pipelines, its boundaries and neighboring uses.

(Please attach a detailed map with a suitable scale to indicate clearly the site, Transportation routes and pipelines, its boundaries and neighboring uses).

- **Brief description of the construction phases and basic, construction methods**

Brief description of the construction phases and basic, construction methods

(Will the activity cause a significant change on the water availability, use, hydrology, drainage, temperature or quality?)

- **Are there existing hazard probabilities. Explain the type, quantity and impact)**

(Are there existing hazard probabilities. Explain the type, quantity and impact)

- **(will the activity affect surface water use)?**

(will the activity affect surface water use)?

- **(Fisheries)**

(Fisheries)

- **Tourism and recreation)**

Tourism and recreation)

- **(Other activities)**

(Other activities)

- **Soil quality**

(would the activity provoke a significant change on landuse, landscape, fertility, vegetation cover, biodiversity or quality?)

(would the activity provoke a significant change on landuse, landscape, fertility, vegetation cover, biodiversity or quality?)

- **Please identify the impact of changes of soil quantity on different activities**

Please identify the impact of changes of soil quantity on different activities

-

d???? ?1 ?????
(I.D No./ Passport No.)

??
(Reference

F???
(Date)

ANNEX E

1. Sample TOR for EIA of New Irrigation Projects

Introduction. Identify the development project to be assessed and explain the executing arrangements for the environmental impact assessment

Description of the Proposed Project. Provide a brief description of the project; using maps (of appropriate scale) where necessary, and including the following information:

- location, general layout, size, capacity
- pre-construction activities and construction activities
- schedule, staffing, facilities and services
- general design and extent of irrigation and drainage works
- size of catchment area
- operation and maintenance of irrigation work

Description of the Environment. Assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences.

- *Physical environment:* geology, topography, soils, climate and meteorology, ambient air quality, surface and groundwater hydrology, existing water pollution discharges, and receiving water quality.
- *Biological environment:* flora, fauna, rare or endangered species, sensitive habitat including protectorates, significant natural sites, species of commercial importance (fish), and species with

potential to become nuisance, vectors or dangerous.

- *Socio-economic environment: population, land use (including current crops and cropping patterns); land tenure and land titling; present water supply and water uses (including current distribution of water resources if irrigation systems already exist in area); control over allocation of resource use rights, community structure, employment, distribution of income, public health, cultural properties, tribal people, customs, aspiration and attitudes.*

Legislative and Regulatory Considerations. Describe the pertinent regulations and standards governing quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc. at the international, national, regional, and local levels. Is the development in accordance with the national, regional and local development and water management plans.

Determination of the Potential Impacts of the Proposed Project. Distinguish between significant positive and negative impacts, direct and indirect, immediate and long-term. Identify impacts which are unavoidable or irreversible. Potential impacts to be assessed include:

-
- *Project Location: resettlement of people; loss of agricultural land (cropping and grazing); impact on flora and fauna; impact on historic and cultural sites; effects on water resources outside and inside command area.*
 - *Project Design: disruption of hydrology; drainage problems; design of dam and other structures; crossings for people and animals.*
 - *Construction Works: soil erosion; construction spoils (disposal of); sanitary conditions and health risks associated with construction camp and workers coming into area; social and cultural conflicts between imported workers and local people.*
 - *Project Operation: pollution by agrochemicals; impacts on soils (waterlogging, salinization, etc.); changes in groundwater levels inside and outside command area; changes in surface water quality and risks of eutrophication; incidence of water-borne and water related diseases.*

Analysis of Alternatives to the Proposed Project.
Describe alternatives that were examined in the course of developing the proposed project and identify alternatives which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Include the “no action”

alternative to demonstrate the case without the development.

Development of Management Plan to Mitigate Negative Impacts. *Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the costs and residual impacts of each measure and the institutional and training requirements to implement them.*

Development of Monitoring Plan. *Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs.*

Secure Interagency Coordination and Public/NGO Participation. *Assist in coordinating the environmental impact assessment with other concerned government agencies, in obtaining the views of local NGO's and affected groups, and in keeping records of meetings and other activities, communications and comments and their disposition.*

Environmental Impact Assessment Report. *The report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting*

those data. The report should be organized as follows:

- *Executive Summary*
- *Policy, Legal and Administrative Framework*
- *Description of the Proposed Project*
- *Description of the Environment*
- *Significant Environmental Impacts*
- *Analysis of Alternatives*
- *Mitigation Management Plan*
- *Environmental Management and Training*
- *Monitoring Plan*
- *Inter-Agency and Public/NGO Involvement*
- *List of References*
- *Appendices:*
 - *List of Environmental Assessment Preparers*
 - *Records of inter-Agency and Public/NGO Communication*
 - *Data and Unpublished Reference Documents*

Consulting Team. *Members of the team should consist of people with the following specializations: environmental impact assessment (with extensive experience in irrigation); rural sociology*

Depending on the baseline data needed and the mitigating measures proposed, the team may also include some of the following disciplines: agronomy; hydrology; terrestrial ecology (plant and wildlife as appropriate to the ecology of the irrigation site and adjacent areas); aquatic ecology and fisheries; soil sciences.

2. Sample TOR for EIA of Irrigation Improvement Projects

Introduction. Identify the development project to be assessed and explain the executing arrangements for the environmental impact assessment

Description of the Proposed Project. Provide a brief description of the project; using maps (of appropriate scale) where necessary, and including the following information:

- location, general layout, size, capacity
- pre-construction activities and construction activities
- schedule, staffing, facilities and services
- general design and extent of irrigation
- operation and maintenance of irrigation work

Description of the Environment. Assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences.

- *Physical environment:* geology, topography, soils, surface and groundwater hydrology, existing water pollution discharges, and receiving water quality.
- *Biological environment:* flora, fauna.
- *Socio-economic environment:* population, land use (including current crops and cropping patterns); land tenure and land titling; present water supply and water uses (including current

distribution of water resources if irrigation systems already exist in area).

Legislative and Regulatory Considerations. Describe the pertinent regulations and standards governing quality, health and safety, siting, land use control, etc. at the international, national, regional, and local levels. Is the development in accordance with the national, regional and local development and water management plans.

Determination of the Potential Impacts of the Proposed Project. Distinguish between significant positive and negative impacts, direct and indirect, immediate and long-term. Identify impacts which are unavoidable or irreversible. Potential impacts to be assessed include:

- *Project Location: resettlement of people; loss of agricultural land (cropping and grazing); impact on flora and fauna; impact on historic and cultural sites; effects on water resources outside and inside command area.*
- *Project Design: disruption of hydrology*
- *Construction Works: soil erosion; construction spoils (disposal of); sanitary conditions and health risks associated with construction camp and workers coming into area.*
- *Project Operation: pollution by agrochemicals; impacts on soils (waterlogging, salinization,*

ete.); changes in groundwater levels inside and outside command area; changes in surface water quality and risks of eutrophication; incidence of water-borne and water related diseases.

Analysis of Alternatives to the Proposed Project. Describe alternatives that were examined in the course of developing the proposed project and identify alternatives which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Include the “no action” alternative to demonstrate the case without the development.

Development of Management Plan to Mitigate Negative Impacts. Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the costs and residual impacts of each measure and the institutional and training requirements to implement them.

Development of Monitoring Plan. Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs.

Secure Interagency Coordination and Public/NGO Participation. Assist in coordinating the

environmental impact assessment with other concerned government agencies, in obtaining the views of local NGO's and affected groups, and in keeping records of meetings and other activities, communications and comments and their disposition.

Environmental Impact Assessment Report. *The report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. The report should be organized as follows:*

- *Executive Summary*
- *Policy, Legal and Administrative Framework*
- *Description of the Proposed Project*
- *Description of the Environment*
- *Significant Environmental Impacts*
- *Analysis of Alternatives*
- *Mitigation Management Plan*
- *Environmental Management and Training*
- *Monitoring Plan*
- *Inter-Agency and Public/NGO Involvement*
- *List of References*
- *Appendices:*
 - *List of Environmental Assessment Preparers*
 - *Records of inter-Agency and Public/NGO Communication*
 - *Data and Unpublished Reference Documents*

Consulting Team. *Members of the team should consist of people with the following specializations: environmental impact assessment (with extensive experience in irrigation); rural sociology*

Depending on the baseline data needed and the mitigating measures proposed, the team may also include some of the following disciplines: agronomy; hydrology; terrestrial ecology (plant and wildlife as appropriate to the ecology of the irrigation site and adjacent areas); soil sciences.

3. Sample TOR for EIA of Drainage Projects

Introduction. Identify the development project to be assessed and explain the executing arrangements for the environmental assessment

Description of the Proposed Project. Provide a brief description of the project; using maps (of appropriate scale) where necessary, and including the following information:

- location, general layout, size, capacity
- pre-construction activities and construction activities
- schedule, staffing, facilities and services
- general design and extent of drainage works
- operation and maintenance of drainage system

Description of the Environment. Assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences.

- *Physical environment:* geology, topography, soils, climate and meteorology, ambient air quality, surface and groundwater hydrology, existing water pollution discharges, and receiving water quality.
- *Biological environment:* flora, fauna, rare or endangered species, sensitive habitat including

preserves, significant natural sites, species of commercial importance (fish), and species with potential to become nuisance, vectors or dangerous.

- *Socio-economic environment: population, land use (including current crops and cropping patterns); land tenure and land titling; present water supply and water uses (including current distribution of water resources if irrigation systems already exist in area); control over allocation of resource use rights, community structure, employment, distribution of income, public health, cultural properties, tribal people, customs, aspiration and attitudes.*

Legislative and Regulatory Considerations. Describe the pertinent regulations and standards governing quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc. at the international, national, regional, and local level. Is the development in accordance with the national, regional and local development and water management plans.

Determination of the Potential Impacts of the Proposed Project. Distinguish between significant positive and negative impacts, direct and indirect, immediate and short-term. Identify impacts which are unavoidable or irreversible. Potential impacts to be assessed include:

-
- *Project Location: resettlement of people; loss of agricultural land (cropping and grazing); impact on flora and fauna; impact on historic and cultural sites; effects on water resources outside and inside command area.*
 - *Project Design: disruption of hydrology; drainage problems; design of dam and other structures; crossings for people and animals.*
 - *Construction Works: soil erosion; construction spoils (disposal of); sanitary conditions and health risks associated with construction camp and workers coming into area; social and cultural conflicts between imported workers and local people.*
 - *Project Operation: pollution by agrochemicals; impacts on soils (waterlogging, salinization, etc.); changes in groundwater levels inside and outside command area; changes in surface water quality and risks of eutrophication; incidence of water-borne and water related diseases.*

Analysis of Alternatives to the Proposed Project.
Describe alternatives that were examined in the course of developing the proposed project and identify alternatives which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction

techniques and phasing, and operating and maintenance procedures. Include the “no action” alternative to demonstrate the case without the development.

Development of Management Plan to Mitigate Negative Impacts. *Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the costs and residual impacts of each measure and the institutional and training requirements to implement them.*

Development of Monitoring Plan. *Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs.*

Secure Interagency Coordination and Public/NGO Participation. *Assist in coordinating the environmental assessment with other government agencies, in obtaining the views of local NGO’s and affected groups, and in keeping records of meetings and other activities, communications and comments and their disposition.*

Environmental Assessment Report. *The report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting*

those data. The report should be organized as follows:

Executive Summary

Policy, Legal and Administrative Framework

Description of the Proposed Project

Description of the Environment

Significant Environmental Impacts

Analysis of Alternatives

Mitigation Management Plan

Environmental Management and Training

Monitoring Plan

Inter-Agency and Public/NGO Involvement

List of References

Appendices:

List of Environmental Assessment Preparers

*Records of inter-Agency and Public/NGO
Communication*

Data and Unpublished Reference Documents

Consulting Team. *Members of the team should consist of people with the following specializations: environmental impact assessment with extensive experience in drainage); rural sociology*

Depending on the baseline data needed and the mitigating measures proposed, the team may also include some of the following disciplines: agronomy; hydrology; terrestrial ecology; aquatic ecology and fisheries; soil science

4. Sample TOR for EIA of Dams, Barrages and Reservoirs

Introduction. *Identify the development project to be assessed and explain the executing arrangements for the environmental assessment*

Description of the Proposed Project. *Provide a brief description of the project; using maps (of appropriate scale) where necessary, and including the following information:*

- *location, general layout, size, capacity*
- *pre-construction activities and construction activities*
- *schedule, staffing, facilities and services*
- *general layout, size and capacity (dam and reservoir specifications, location of outlets, etc.), and life-span of the dam and reservoir.*

Description of the Environment. *Assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences.*

- *Physical environment: geology, topography, soils, climate and meteorology, ambient air quality, surface and groundwater hydrology, existing water pollution discharges, and receiving water quality: including watershed, site of the dam and reservoir and downstream areas, especially floodplain.*
- *Biological environment: flora, fauna, rare or endangered species, sensitive habitat including*

protectorates, significant natural sites, species of commercial importance (fish), and species with potential to become nuisance, vectors or dangerous.

- *Socio-economic environment: population, land use (including current crops and cropping patterns); land tenure and land titling; present water supply and water uses (including current distribution of water resources if irrigation systems already exist in area); control over allocation of resource use rights, community structure, employment, distribution of income, public health, cultural/heritage properties, tribal people, customs, aspiration and attitudes.*

Legislative and Regulatory Considerations. Describe the pertinent regulations and standards governing quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc. at the international, national, regional, and local level. Is the development in accordance with the national, regional and local development and water management plans.

Determination of the Potential Impacts of the Proposed Project. Distinguish between significant positive and negative impacts, direct and indirect, immediate and short-term. Identify impacts which

are unavoidable or irreversible. Potential impacts to be assessed include:

- (a) Social and ecological effects of reservoir inundation (loss of agricultural, forestry and grazing land, population resettlement, effects on wildlife and wildlands, etc.)*
- (b) Effects on the hydrology and water quality of the river (and where relevant, the estuarine, coastal and marine resources).*
- (c) Effects on river fisheries and potential for creating a reservoir fisheries resource.*
- (d) Impacts of altering river flow regimes on the ecology of the floodplain, and the economic activities/ land use on the floodplain (agriculture, livestock production, etc.).*
- (e) Impact of altering water supply on urban, industrial, and rural users.*
- (f) Potential environmental and social impacts by planned and unplanned (spontaneous) in-migration into the area.*
- (g) Potential for increased incidence of water-borne and water-related diseases.*
- (h) Impact on terrestrial and aquatic wildlife, by creation of the reservoir,*

disruption of migration routes, alteration of floodplain ecology, and population impacts.

- (i) *Effect of existing and predicted land use in the watershed on the functioning and longevity of the dam and reservoir.*

Analysis of Alternatives to the Proposed Project. Describe alternatives that were examined in the course of developing the proposed project and identify alternatives which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Include the “no action” alternative to demonstrate the case without the development.

Development of Management Plan to Mitigate Negative Impacts. Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the costs and residual impacts of each measure and the institutional and training requirements to implement them.

Development of Monitoring Plan. Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project

during construction and operation. Include in the plan an estimate of capital and operating costs.

Secure Interagency Coordination and Public/NGO Participation. Assist in coordinating the environmental impact assessment with other government agencies, in obtaining the views of local NGO's and affected groups, and in keeping records of meetings and other activities, communications and comments and their disposition.

Environmental Impact Assessment Report. The report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. The report should be organized as follows:

- Executive Summary
- Policy, Legal and Administrative Framework
- Description of the Proposed Project
- Description of the Environment
- Significant Environmental Impacts
- Analysis of Alternatives
- Mitigation Management Plan
- Environmental Management and Training
- Monitoring Plan
- Inter-Agency and Public/NGO Involvement
- List of References
- Appendices:

List of Environmental Assessment Preparers

*Records of inter-Agency and Public/NGO
Communication
Data and Unpublished Reference
Documents*

Consulting Team. *Members of the team should consist of experts with the following specializations: environmental planning and management; hydrology; terrestrial ecology (plant ecology, forestry and wildlife); aquatic ecology and fisheries; watershed management; soil science and geology (where relevant); public health, particularly specialty in water borne and water-related diseases; rural sociology.*

5. Sample TOR for EIA of Flood Protection

Introduction. Identify the development project to be assessed and explain the executing arrangements for the environmental assessment

Description of the Proposed Project. Provide a brief description of the project; using maps (of appropriate scale) where necessary, and including the following information:

location, general layout, size, capacity

pre-construction activities and construction activities

schedules, staffing, facilities and services

scheme's general design, capacity and degree of protection for various flood levels

Description of the Environment. Assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area including watershed areas, the sites of flood control structures and floodplain areas.

Physical environment: surface and groundwater hydrology (annual peak discharge, recurrence intervals of various peak discharges, and peak stages for various discharges).

Biological environment: flora, fauna, rare or endangered species, sensitive habitat including protectorates, significant natural sites, species of

commercial importance (fish), and species with potential to become nuisance, vectors or dangerous.

Socio-economic environment: population, built environment/land use (including current crops and cropping patterns); land tenure and land titling; present water supply and water uses (including current distribution of water resources if irrigation systems already exist in area); control over allocation of resource use rights, community structure, employment, distribution of income, public health, cultural properties, tribal people, customs, aspiration and attitudes.

Legislative and Regulatory Considerations. Describe the pertinent regulations and standards governing quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc. at the international, national, regional, and local level. Is the development in accordance with the national, regional and local development and water management plans.

Determination of the Potential Impacts of the Proposed Project. Distinguish between significant positive and negative impacts, direct and indirect, immediate and long-term. Identify impacts which are unavoidable or irreversible. Potential impacts to be assessed include:

-
- (a) *Effects of the flood control dam: direct environmental impacts of the dam construction and reservoir inundation; effects on fisheries resource (creation of a reservoir fisheries); effects on water quantity and quality; effects on floodplain ecology.*
- (b) *Effects of flood control structures and measures (e.g., levees, dikes and channelization measures) on: aquatic ecology, particularly fish resources; hydrology, including groundwater recharge, and water quality; plant and animal ecology of the floodplain.*
- (c) *Socio-economic impacts on populations in inundation area and downstream (floodplain dwellers, urban population, etc.) through: land use changes; impacts on water-related economic activities (e.g., fisheries, transportation, etc.); health effects (e.g., increased incidence of water-borne and water-related diseases).*

Analysis of Alternatives to the Proposed Project.

Describe alternatives that were examined in the course of developing the proposed project and identify alternatives which would achieve the same objectives. The concept of alternatives extends to siting, design, technology selection, construction techniques and phasing, and operating and maintenance procedures. Include the “no action”

alternative to demonstrate the case without the development.

Development of Management Plan to Mitigate Negative Impacts. *Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the costs and residual impacts of each measure and the institutional and training requirements to implement them.*

Development of Monitoring Plan. *Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project during construction and operation. Include in the plan an estimate of capital and operating costs.*

Secure Interagency Coordination and Public/NGO Participation. *Assist in coordinating the environmental assessment with other government agencies, in obtaining the views of local NGO's and affected groups, and in keeping records of meetings and other activities, communications and comments and their disposition.*

Environmental Impact Assessment Report. *The report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. The report should be organized as follows:*

Executive Summary
Policy, Legal and Administrative Framework
Description of the Proposed Project
Description of the Environment
Significant Environmental Impacts
Analysis of Alternatives
Mitigation Management Plan
Environmental Management and Training
Monitoring Plan
Inter-Agency and Public/NGO Involvement
List of References
Appendices:
List of those preparing Environmental Impact Assessment
Records of inter-Agency and Public/NGO Communication
Data and Unpublished Reference Documents

Consulting Team. *Members of the team should consist of experts with the following specializations: environmental planning and management; fisheries and/or aquatic ecology; hydrology, watershed management and forestry; terrestrial ecology and wildlife ecology, etc. (for impacts in the inundation area and on the floodplain); and sociology.*

7.88.2 6. Sample TOR for EIA of Shore Protection Projects

Introduction. Identify the development project to be assessed and explain the executing arrangements for the environmental assessment

Description of the Proposed Project. Provide a brief description of the project; using maps (of appropriate scale) where necessary, and including the following information:

location, general layout and size

pre-construction activities and construction activities

schedule, staffing, facilities and services

The function of the structure

Layout and Engineering design

The construction method

Operation and maintenance

Risk of failure

Execution risk

Morphological changes

Durability

Capability of reducing offshore and long shore transport gradient

Possibility of using sediment traps or silt curtains

Description of the Environment. Assemble, evaluate and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences.

Above and below water surface characteristics, terrain stability, slope gradient, susceptibility to erosion or landslip.

Any materials to be disturbed or altered or to be used for landscaping: - include the source of any fill and destination and use of excavated or dredged material; characteristics that may be relevant include the physical or chemical properties of soil or sediment including depth, particle size distribution, permeability, pH, suitability of soil for landscaping or reclamation.

7.88.2.1.2 Coastal Changes

Meteorological data collection and measurements:- include prevailing wind direction, waves, currents and tides.

Bathymetric maps to a readable scale and survey report showing relation to a known datum, previous bathymetric surveys should also presented.

Source of data and prediction methods, including reliability of the method used.

Sediment samples and analyses.

*7.88.2.1.3**7.88.2.1.4 Hydrological Issues*

Existing drainage patterns; the range of water levels, wave climate, tidal patterns, wave heights, daily flushing regime, storm surge or flood levels; the flood liability of sites and adjacent land; the depth to and condition of groundwater likely to be affected by the proposal.

Changes in water movement patterns, groundwater hydrology, flushing and surface sediment transport processes.

7.88.2.1.5 *Water Quality and Waste Management Issues.*

The existing condition of any surface water or groundwater body that may be changed as a result of the project

Potential accidental, incidental, deliberate or managed discharge or release of materials from shore or water-based activities.

Dredging or other construction or operational activities leading to changes in nutrient and contaminant levels, salinity, stratification, sediment or changes to flushing.

7.88.2.1.6 *Flora and Fauna Issues*

If terrestrial or aquatic flora or fauna or their habitat are likely to be disturbed, issues to consider include:

Identifying terrestrial and aquatic plant/animal habitats (including marine, fresh water and intertidal areas), ecological communities and where appropriate, populations and species in areas that may be directly or indirectly affected by the proposal, this is done through an extensive survey program.

Social / Economic Issues

7.88.2.1.7

Health and safety

Amenity

Public access such as disabled access to public land and waterways.

Employment at the site and in the community as a result of the proposal.

Legislative and Regulatory Considerations. Describe the pertinent regulations and standards governing quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc. at the international, national, regional, and local level. Is the development in accordance with the national, regional and local development and water management plans.

Determination of the Potential Impacts of the Proposed Project. Distinguish between significant positive and negative impacts, direct and indirect, immediate and short-term. Identify impacts which are unavoidable or irreversible. Potential impacts to be assessed include:

Project Location: impacts on fauna and flora, terrestrial habitat and re-colonization of some species. Economic impacts on other industries, fisheries and boating activities within the vicinity of the project. Impacts of generated traffic in the locality as well as impacts on land value loss of access to public land and water ways.

Project design: impacts on structures of coastline and coastal landforms. Change in water movement pattern and sediment transport process. Movement of ground water regime and salty water intrusion.

Construction Works: air and water quality degradation due to the activities material involved

in the construction camps. Sanitary and health problems on the construction sites as well as conflicts between local and imported workers.

Project Operation: water and air quality degradation as a result of the operation activities. Sanitary and health problems from the sanitary problems on the site.

Analysis of Alternatives to the Proposed Project. Describe alternatives that were examined in the course of developing the proposed project and identify alternatives which would achieve the same objectives. The concept of alternatives extends to siting, design, structure selection, construction techniques and phasing, and operating and maintenance procedures. Include the “no action” alternative to demonstrate the case without the development.

Development of Management Plan to Mitigate Negative Impacts. Recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels. Estimate the costs and residual impacts of each measure and the institutional and training requirements to implement them.

Development of Monitoring Plan. Prepare a detailed plan to monitor the implementation of mitigating measures and the impacts of the project

during construction and operation. Include in the plan an estimate of capital and operating costs.

Secure Interagency Coordination and Public/NGO Participation. *Assist in coordinating the environmental assessment with other government agencies, in obtaining the views of local NGO's and affected groups, and in keeping records of meetings and other activities, communications and comments and their disposition.*

Environmental Impact Assessment Report. *The report should be concise and limited to significant environmental issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. The report should be organized as follows:*

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Mitigation Management Plan

Environmental Management and Training

Monitoring Plan

Inter-Agency and Public/NGO Involvement

List of References

Appendices:

List of Environmental Assessment Preparers

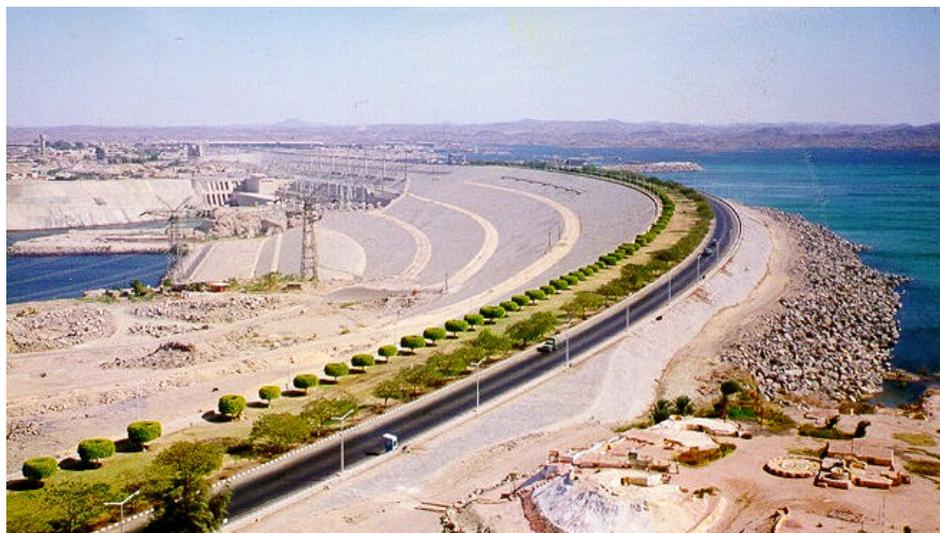
*Records of inter-Agency and Public/NGO
Communication*

Data and Unpublished Reference Documents

Consulting Team. *Members of the team should consist of experts with the following specializations: environmental impact assessment, coastal engineering, coastal geology, hydrology, oceanography and marine biology.*

**Ministry of Water Resources and Irrigation
US Agency for International Development
Agricultural Policy Reform Program
Environmental Policy and Institutional Strengthening Indefinite Quantity Contract**

**APRP—Water Policy Activity
Contract PCE-1-00-96-00002-00
Task Order 807**



ENVIRONMENTAL MANAGEMENT AT MWRI

***Report No. 51
Appendix B***

December 2001

Water Policy Program

International Resources Group

Winrock International

Nile Consultants

ENVIRONMENTAL MANAGEMENT AT MWRI

STAKEHOLDERS WORKSHOP REPORT

1. Purpose of the Workshop

The main objectives of the workshop were to:

- Exchange knowledge and experience regarding Environmental Impact Assessment (EIA) for MWRI activities;
- Seek consensus on the importance of public participation;
- Present and discuss major contents of the draft MWRI source book;
- Recommend strengthening institutional setup (unit, staff, funding) procedures and mechanisms to support the EIA process in MWRI including a plan to implement such policy; and
- Discuss the relation between MWRI and EEAA.

8 Workshop Agenda

The workshop was held in Helnan Hotel, Ras Sudr on October 17-19, 2001. A total of 35 stakeholders attended the meeting. Names and institutions of participants are attached (Annex 1). The meeting proceeded according to the Agenda attached (Annex II).

Mr. Andrew Tczap, Chief of Party EPIQ/WPRP gave an overview of the APRP Water Policy Program.

Eng. Gamil Mahmoud, Head of WPAU, welcomed the participants and emphasized the importance of the stakeholders' involvement in setting a comprehensive policy and formal procedures for managing the challenges in the changing water environment.

Eng. Nasser Ezzat, WPAU task manager, presented the benchmark activities carried out and indicated the purpose of the workshop. He mentioned that the specific objective of the meeting was to exchange among stakeholders knowledge and experience regarding EIA.

Dr. Ahmed Abu-El-Azm, EEAA, spoke on EIA in Egypt in general and EEAA role. He also discussed EIA general procedure and explained EIA as a process.

Dr. Ali Nasser, Gaber Group Consultant, addressed in his presentation the environmental aspects of MWRI projects. He explained the guidelines for preparing EIA for the different types of projects undertaken by the MWRI.

Dr. Ahmed Gaber, Gaber Group Consultant, spoke on EIA organization framework within MWRI. He presented a work plan for establishing EIA body and set a timetable to make it fully operational within 24 months. The main elements of his work plan are institutional setting, staffing,

procedure manual, operation manual, human resources development and networking.

Issues that were raised during the speakers' presentation were discussed among two working groups. Each working group was issued a sheet with suggested sub-topics to be considered during their deliberations. The contents of that sheet are as follows:

- Responsibilities of MWRI according to environmental law 4;
- MWRI work plan and institutional issues.

WORKING GROUP TOPICS

Working Group 1

8.1.1.2.1.1.1.1 Working Group 2

8.1.1.2.1.2

.1.2.1.3

Responsibilities of MWRI
According to Law 4

Plan and Ir

Relation with EEAA

How to build EIA as a process within MWRI

Near Term

Proposed institution

Long Term

Staff training

Timetable needed.

**8.1.1.1.1.1 Execution of
EIA**

8.1.1.2.1.3.1.1

All projects or selected
projects?

In-house/consultants/
combination?

MWRI as CAA

Review EIA in-house?

Request EEAA to
review?

8.1.1.2 Public Participation

**8.1.1.2.1 Stakeholders
only**

Full and open public
involvement

8.1.1.2.1.1.1.1

The working groups deliberated for the two and a half hours allotted to them. Each group then reported the consensus opinion, resulting

from their deliberations. The opinions presented by the groups are summarized as follows:

Responsibilities of (MWRI) according to Law 4

Relation with EEAA

1. Cooperation regarding definition of training courses for MWRI staff and other related activities.

2. Establishment of a committee from both sides (MWRI and EEAA) and this committee has to have periodical meetings. The responsibilities of this committee are to: -

- Adaptation of MWRI activities according to EEAA regulations
- Solving problems resulted from EEAA requirements and the MWRI needs.

The committee should have the final decision regarding the EIA approval.

9 Execution of EIA

The existing environmental units in each sector have to screen their projects & classify them into A, B or C groups based on available data & experiences. The results from the first screening should be submitted to the central environmental unit & the proposed committee. The execution of the EIA study is the responsibility of the central environmental unit:

- *EIA study could be by the central unit.*
- *The unit could hire some experts to help in preparing the EIA study, if some fields of expertise are not available.*
- *An external consultant could be hired to prepare the study, especially for projects in List C.*

MWRI as a CAA

All of the EIA studies submitted to the MWRI by a CAA should be reviewed by the unit before sending to the EEAA (according to the EIA cycle system to process applications in the Egyptian Environmental Affairs Agency (EEAA) – Figure 2.2, MWRI-EIA source book).

Public participation

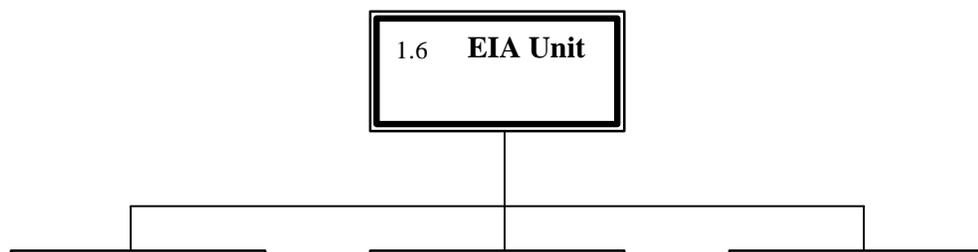
In the near term, the stakeholders should be involved in the EIA study, while in the long term full & open public involvement is required. However, this activity can be coordinated with the public participation in decision-making procedures within the MWRI.

MWRI Plan & Institutional Issues

Unit Responsibilities

- 1. Determinations of guidelines & the distribution of it among the MWRI.*
- 2. Provide technical support for the MWRI in all project stages (bidding, evaluation, etc.).*
- 3. The unit is the only authorized representative dealing with EEAA*
- 4. Legal representative of the MWRI in all the EIA issues.*
- 5. Carrying on EIA capacity building & environmental awareness*
- 6. Coordination between MWRI entities & EEAA.*

PROPOSED INSTITUTIONAL ARRANGEMENT:-



This is a tentative proposal that can be adapted according to MWRI's final decision.

Organizational options for the unit

Three alternatives have been suggested: -

- 1. Directly affiliated to the Minister's office.*
- 2. Directly affiliated to the first undersecretary's office.*
- 3. Within the planning sector.*

Timetable

The proposed timeline can be shortened to 1.5 years instead of 2 years.

Sources of Funding

- 1. Governmental.*
- 2. International Donors.*

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