INTEGRATED WATER RESOURCE MANAGEMENT II

TRAINING NEEDS ASSESSMENT OF THE MINISTRY OF WATER RESOURCES & IRRIGATION
REPORT NO.8

July 2009

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REPORT NO. 8

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DISCLAIMER
The author’s views expressed in this publication do not necessarily reflect the views of the United States Agency for International Development or the United States Government.
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This study is to identify training needs to assist the MWRI to move forward in its reform process after the new structure is defined and positions with the new structure are established. The study team would like to acknowledge the contributions and support of the many senior officials of MWRI who were instrumental in launching the training need survey.

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ACRONYMS & TERMS

AUC  American University Cairo
BCM  Billion Cubic Meters
EPADP Egyptian Public Authority for Drainage Projects
ID  Irrigation Department
IDOS Institutional Development and Organizational Strengthening
IRG  International Resources Group (Prime Contractor for IWRM II)
IWMU Integrated Water Management Unit
IWRMP Integrated Water Resource Management Project
KSA  Knowledge, Skills and Attitudes
MWRI Ministry of Water Resources and Irrigation
NWRC National Water Research Center
PAS Performance Appraisal System
TC  Training Center of MWRI
PIM Participatory Irrigation Management
WCU Water Communication Unit
TNA  Training Needs Assessment
RCTWS Regional Center for Training and Water Studies
WM  Water Quantity Management
WQMPC Water Quality Management and Pollution Control
USAID United States Agency for International Development
EXECUTIVE SUMMARY

Background

The need to manage overall water resources more coherently and to facilitate the allocation of water among all users requires an expansion of national integrated planning. The critical institutional challenge is to develop policies; rules; organizations and management skills that can address both needs simultaneously without constraining the major aims of each. Therefore, capacity building is foremost a global concept and strategic element in the sustainable development of the water sector and it is a long-term continuing process that has to permeate all activities in the sector.

The MWRI gives great importance to the training and upgrading technical capacity of its staff through a process of local consolidation and wide decentralization, including devolution of authority to the local level. New mandates for the Ministry are to enhance: participatory irrigation management; stakeholder engagement and public participation; integration of environmental considerations into water resources planning and management; improved coordination approaches between institutions utilizing modern information technology; and market-based instruments for improved water use efficiency and water quality management.

These new developments require different capacity building approaches. Training should be more focused to meet future demands of water users and give the right attention to environmental, social and economical aspects of water resources.

This study is to identify training needs to assist the Ministry to move forward in the reform process after the new structure is defined and positions with the new structure are identified and their job description are prepared.

TNA objectives

The aim of this study is to:

• Carry out a training need survey to collect data on the knowledge, skills and attitudes required for successful job performance.
• Provide an outline for the intensive capacity building program to prepare MWRI staff to function effectively as the Ministry role and responsibilities change in the future.
• Give more attention to academic training.

Methodology

• Reviewing all available relevant documents.
• Interviewing involved persons.
• Analyzing all items of data collected.

Current policy and Institutional Reform in MWRI

There are many challenges influencing water management in Egypt as: agriculture expansion; water shortage; water pollution, stakeholder participation; public awareness and economic incentives;
information base, size of agriculture land holdings; legislation and revenue generation and socio-economic aspects.
To cope with these challenges, the MWRI has developed a national policy with three major pillars: 1) increasing water use efficiency; 2) water quality protection and pollution control and 3) water supply augmentation.

**Human resources development strategy**

The main objectives of human resources development in MWRI are:
- Individual growth;
- Integrating the objectives of individuals and those of the Ministry;
- Attracting competent calibers to work in the Ministry;
- Increasing the clarity of career paths to all engineers, researchers, specialists and administrators;
- Correlating between career prospects and training and individual development, and
- Developing objective performance appraisal and incentive system.

The elements of the human resources development strategy are: staff recruitment; capacity building; training; staff performance assessment system; incentive system, and personal information system.

**Training Needs Assessment**

It is the most important step in designing human resource development initiatives within the MWRI. The four types of training that would be in a systematic training plan are as follows:
- In-service short-term training.
- Adjustment or reorientation training.
- Project and task force training.
- Academic training.

**Training needs survey**

Training needs survey started by surveying a range of informed sources and asked what training they think is required by a group of employees. Among the training subjects needed by MWRI staff are the following:
- Business Management.
- Human resources development.
- Financial business.
- Water communication.
- Water extension.
- Environmental engineering and water quality protection and pollution control.
- Integrated water resources management.
- Hydro-Informatics.
- Other fields of interest to the MWRI.

At the same time different units suggested different criteria for candidates specifications. These criteria are characterized such as:
- Educational attainment.
- Experience and years of experience.
- Special skills and abilities.
- Age.
- Others.
Conclusions

- Training in the future should be carried out within a broader framework that includes developing the management capacity within the Ministry departments and projects. There is growing recognition that irrigation technology must also take into account environmental considerations and sociological characteristics such as farmer's behavior. Human resources development programs for MWRI should also include training in:
  - Planning (including corporate and strategic planning, organization planning and financial planning)
  - Integrated Water Resources Management
  - Participatory Irrigation Management
  - Environmental Engineering and Water Quality
  - Public Participation in Decision-Making
  - Leadership and Management Skills; and
  - Information Management

- A priority list for academic training of 23 trainees is prepared. It shows the subject of training, number of trainees for each subject, the category of training, the MWRI unit that needs training in this subject and qualification of trainee.

- Academic training should be reserved for employees who demonstrate high quality and self motivation in the performance of their duties, that is, those who concisely strain or exceed their established work targets.
1. INTRODUCTION

1.1. GENERAL

A Training Needs Assessment (TNA) is the first and perhaps most important step in designing human resources development initiative in the Ministry of Water Resources and Irrigation (MWRI). In light of the major changes in the visions, policies and water resources situation in Egypt, training and capacity building of the MWRI and other stakeholders are in serious need to be assessed and revised to face these challenges and to be able to manage the ongoing and anticipated water policy reform activities and the corresponding institutional changes.

The MWRI has a long-term goal to recognize its internal functions and operations through a process of local consolidation and ministry-wide decentralization, including devolution of authority to the local level. New mandates for the ministry will be to enhance: participatory irrigation management; stakeholder engagement and public participation; integration of environmental considerations into water resources planning and management; improved coordination approaches between institutions utilizing modern information technology; and market-based instruments for improved water use efficiency and water quality management.

These new developments require different capacity building approaches. Training should be more focused to meet future demands of water users and give the right attention to environmental, social and economical aspects of water resources.

This study is to assess training needs to assist the ministry to move forward in the reform process after the structure of the ministry is defined by the Institutional Reform Unit and positions with the new structure are identified and their job descriptions are prepared.

1.2. STUDY OBJECTIVE

The TNA focuses on Masters degree training for MWRI personnel. The study follows procedures used during the 2003 assessment carried out with support and participation of MWRI. It includes an organizational analysis to identify overall MWRI needs and capabilities, development of appropriate criteria for program and trainees selection and collection of information on academic institutions, curriculum and potential trainees.

1.3. STUDY METHODOLOGY

The major means of data collection and information were review of relevant documents and interviews implemented by informal group and individual discussions with MWRI Departments Heads. The interviews were critical as they identified clearly the problems faced by MWRI personnel in carrying out their responsibilities and activities.

There is a large body of published and unpublished reports on Egyptian water resources in general and current policy and institutional reforms in the MWRI in particular. The study team has consulted many of these reports, which are available at the Ministry.
Complementing the heavy reliance on views of the Ministry officials, the analysis and interpretation of these views largely reflect the professional views of the study team members. Clearly, there are limitations to data collected and so dependent on interviews (perceptions) rather than direct observation. Nevertheless, it is believed that the issues and opportunities that emerge are real and useful to the MWRI.

1.4. ORGANIZATION OF THE REPORT

The report is organized as follows:

- Chapter 1 is an introduction including study objectives and methodology.
- Chapter 2 concisely describes the current state of water resources management in Egypt and the role of the MWRI in managing water resources. It also briefly describes the current policy and institutional reforms in the MWRI and the needs for staff capacity building through effective training.
- Chapter 3 discusses the objectives of human resources development and the elements of its strategy and the present situation in MWRI with respect to human resources development.
- Chapter 4 describes the steps, which comprise the training needs assessment methodology and provides how it has been implemented.
- Chapter 5 presents analysis of training needs survey.
- Finally, chapter 6 is devoted to the study conclusions including priority list for M.Sc subjects and training of 23 trainees to start by September this year.

The following items have been included as follows:

- Annex B. Common Training Needs: An indicative list of categories of staff and their requirements.
- Annex C. Research / Facilities / Program of Studies of some American and Egyptian Universities.
- Annex D. Workplan for IWRM II Task 2.4 “Capacity Building of MWRI Personnel”.
- Annex E. Agreement between IRG & AUC
2. CURRENT POLICY AND INSTITUTIONAL REFORMS IN MWRI

2.1. WATER RESOURCES CHALLENGES IN EGYPT

The water resources challenges summarized in this section have been recognized by MWRI for some time now. That recognition triggered a series of structural, institutional and policy reforms that MWRI has successfully instituted over the past twenty years. This brief review of challenges influencing water management in Egypt is presented to acquaint the reader with the Egyptian water resources context and the motivating force behind MWRI’s ongoing and ambitious future policy adjustment program. In the following a very general overview of water management issues and problems is presented.

Agricultural Expansion

In order to accommodate the employment requirements of a fast growing population and to face the increasing gap between domestic food production and consumption, the government is planning by 2017 to expand its cultivated area by 3.4 million feddans. Irrigation and other infrastructure for most of these new areas are already under design or construction. The ambitious plans for agricultural expansion in Nile delta, north Sinai and southern Egypt will extract 10 bcm or more of the Nile’s waters. This requirement is planned to be secured through: greater water reuse, especially for irrigation from agricultural drains, increased groundwater use, particularly conjunctive use for irrigation; reduced water conveyance losses through irrigation system improvements; reduced cultivation of high water requirement crops such as sugar cane and rice; and introduction of new crop varieties have high value and low water requirements. Enormous investments will be required for irrigation system improvements, water reuse pumping stations and groundwater wells.

Water Shortage

A fixed annual quota of 55.5 billion cubic meters (bcm) from the Nile River flows into Egypt according to the 1959 agreement with Sudan. A second current source is the deep groundwater of the Nubian Aquifer Reservoir in the Western Desert. Although these deep groundwater resources are not renewable, it is estimated that they can be mined at a rate of 4 bcm/year for the next 100 years. The share of water per capita in Egypt is currently about 750 cubic meters per year (m³/yr), which places it below the "water poverty level" of 1000 m³/yr. Further the country's water demands are in excess of available supplies—the deficit being filled by reusing drainage water. Therefore, Egypt is facing a potential water scarcity situation due to increasing demands against a fixed supply of the resource, which could limit the country's ability to implement its overall economic development plans.
Water Pollution

A steady increase in population and continuing expansion of urbanized and industrialized areas have meant that water pollution problems are on the rise. Significant quantities of municipal and industrial wastes are presently discharged into the Nile River, canals and drains without proper treatment and cause chemical and biological pollution. Agricultural activities, especially excessive fertilizer and pesticide use and associated run-off, are another source of pollution. Over-pumpage of groundwater, particularly from coastal aquifers or from groundwater reservoirs close to geological formations carrying saline water, is increasing groundwater salinity with negative impact on land use.

Stakeholder Participation

Inadequate information dissemination and communication between government institutions and non-governmental stakeholders is unduly complicating the water distribution process and constraining dialogue on water policies and programs. While the government through MWRI remains responsible for delivery of irrigation water to farmers free of a service charge, farmers have no clear roles and responsibilities for contributing to the planning and management of the irrigation system. It should eventually be possible for many water management issues to be resolved directly at the local level between organizations representing water users without much government involvement. Recently, Branch Canal Water User Associations were formed in some areas to increase participation of farmers in water resource decision making and maintenance of branch canals infrastructure.

Public Awareness and Economic Incentives

Awareness on the part of the public is weak regarding the current and growing water shortages and pollution problems facing Egypt. Illegal rice cultivation and unauthorized agricultural expansion and fish farming often are blamed on this poor appreciation of the adverse environmental and social impacts of such actions, but the real problems are related to the economic status of inhabitants, lack of enforcement of existing regulations and the fact that farmers are simply responding to the economic incentives they face. Effective public awareness necessitates actions that take into account the complex interaction between economic status, enforcement of water management regulations and the need for appropriate economic incentives to affect individual and institutional behavior. A Water Communication Unit WCU was established within the MWRI.

Information Base

Operation of the irrigation network is still largely based on the monitoring of water levels and not flow volumes. MWRI recognizes the importance of volumetric water distribution and has adopted policies to require it. Much has been accomplished, however the high cost of system rehabilitation is a constraint on the speed of reaching full implementation. There also are no meters for many groundwater wells, resulting in a lack of data on groundwater withdrawals which adversely impacts rational planning. In municipal water supply networks, most meters do not function and use rates are estimated based on limited information. Consequently, there is inadequate data on municipal and industrial water use and on the losses within water supply networks. As for water quality measurements, they too were few in the past, even along the Nile River and main canals. The available ground waters are for a limited set of parameters. Recent policy adjustments have resulted in significant improvements in water quality monitoring and improvement is continuing. Free exchange of information on water quality between concerned ministries does not exist at present.
Size of Agricultural Land Holdings

Holdings fragmentation is a significant factor affecting the future of Egypt's agriculture sector, particularly in the Delta region and Nile Valley. Farm size has direct impacts on agricultural production efficiency, marketing, water use efficiency and the income of farm households, which have become one of the poorest sectors nationwide. The average size of land holdings has significantly decreased during the last century. Many farm families, in the absence of an ability to switch to higher valued crops, would not be able to cover their living expenses from crop production alone without supplemented income from animal husbandry and outside labor.

Legislation

Some existing water laws require revision to reflect present day conditions. The introduction of market-based instruments as policy tools deserves careful attention in these legislative reforms. It is also necessary to enhance enforcement of existing water-related laws to reduce their continued violation. There is no legislation that allows the government and/or user organizations to collect fees for the provision of irrigation services. Despite progress on the ground with pilot activities, there is no clear legislation covering participation of the private sector in water management and services, nor is there any that defines allowable user participation. Law 12 and its executive regulation were issued to provide a legal basis for irrigation and drainage issues based on the vision of the 1980’s. Given the major changes in vision and policies, the increasing scarcity of water, the diversion of Nile Water to new lands, and the increased importance of stakeholders participation, the law was carefully reviewed and revised by the MWRI.

Revenue Generation

To supply irrigation water to the newly reclaimed lands, the irrigation network has been extended eastward to Sinai, westward to the North Coast and Southward to Toshka. These expansions have required huge investments that have not been offset by revenues generated by the agriculture or water sector as yet. MWRI established holding companies in these areas to operate and maintain the water delivery system. These companies will generate income through land sales and service fees. The experience gained will provide valuable lessons for Participatory Irrigation Management Organizations in future. Moreover, large investments are still required for a variety of capital improvement to the irrigation system. It will be difficult to continue to provide needed investments in the water sector from the government budget. At present the government is using grants and loans from donor countries and organizations to complement the available local fund for the major infrastructure investments.

2.2. THE PRESENT ROLE OF THE MINISTRY OF WATER RESOURCES AND IRRIGATION

Under law 12 of 1984, the Ministry of Water Resources and Irrigation (MWRI) has the overall responsibility for appropriating and distributing water and for managing drainage, groundwater and the Mediterranean coastline. In addition, under law 48 of 1982, the Ministry has the responsibility for controlling the inflow of pollutants into waterways. To undertake these responsibilities the MWRI has established a set of units and agencies. In addition to the Minister’s Office and the administrative support staff the primary units and agencies include:

• Planning Sector-responsible for providing technical advice to policy-makers, for preparing water resources development plans and for planning investments in water resources development.
• Nile River Sector-responsible for keeping track of the water resources of the Upper Nile, for overseeing the execution of the treaty with Sudan over the Nile water and for planning works on the Upper Nile.

• Irrigation Department-responsible for construction, operation and maintenance of the system for the distribution of water; also responsible for regulation of the use of groundwater and for construction, operation and maintenance of the barrages and reservoirs that control the Nile River below Aswan High Dam.

• Mechanical and Electrical Department-responsible for installing and operating pumping stations for irrigation and drainage purposes.

• Drainage Authority-responsible for establishing, operating and maintaining tile and surface drainage systems.

• High Aswan dam Authority-responsible for operating and maintaining the Aswan High Dam and Lake Nasser.

• Shore Protection Authority-responsible for protecting sea-coast.

• Survey Authority -responsible for surveying and mapping the lands of Egypt.

• National Water Research Center-responsible for finding solutions to the key problems of water resource management in Egypt.

• Training Center-responsible for human resources development.

Fig. 2.1 shows relationships among these units of the Ministry. Table 2.1 shows the MWRI Staff distribution in the Ministry Units. The number of ministry employees equal 112,553 with 53% permanent employees and 47% temporary employees. The MWRI staff comprise of 5% Engineers, 35% Employees and 60% Labors.

Reflecting the fundamental importance of operating the water distribution system, the Irrigation Department is by far the largest of this units of the approximately 112500 employees of the Ministry( compared to 97610 in 2003), almost 54000 (compared to about 40 000 in 2003) are employees of the Irrigation Department, the next largest unit, the Mechanical and Electrical Department, have about one third of the number of engineers in Irrigation Department.
Source: Minister's Office for Research and Special Studies, MWRI 2009

Figure 2-1 Organization Chart of the Ministry of Water Resources and Irrigation
## Table 2-1 The MWRI Staff

<table>
<thead>
<tr>
<th>Section</th>
<th>Engineers</th>
<th>Employees</th>
<th>Labors</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Permanent</td>
<td>Temporary</td>
<td>Permanent</td>
<td>Temporary</td>
</tr>
<tr>
<td>Minister’s Office</td>
<td>38</td>
<td>0</td>
<td>57</td>
<td>34</td>
</tr>
<tr>
<td>Irrigation Department</td>
<td>2021</td>
<td>694</td>
<td>14322</td>
<td>8747</td>
</tr>
<tr>
<td>Drainage Authority</td>
<td>683</td>
<td>310</td>
<td>1657</td>
<td>5025</td>
</tr>
<tr>
<td>Survey Authority</td>
<td>204</td>
<td>27</td>
<td>2098</td>
<td>218</td>
</tr>
<tr>
<td>High Aswan Dam Authority</td>
<td>79</td>
<td>14</td>
<td>350</td>
<td>131</td>
</tr>
<tr>
<td>Shore Protection Authority</td>
<td>62</td>
<td>7</td>
<td>99</td>
<td>41</td>
</tr>
<tr>
<td>Mechanical and Electrical</td>
<td>1010</td>
<td>86</td>
<td>2384</td>
<td>2162</td>
</tr>
<tr>
<td>National Water Research Center</td>
<td>140</td>
<td>20</td>
<td>745</td>
<td>438</td>
</tr>
<tr>
<td>Regional Center for Training and Water Studies</td>
<td>4</td>
<td>2</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Nile Water Sector</td>
<td>0</td>
<td>15</td>
<td>83</td>
<td>59</td>
</tr>
<tr>
<td>Total</td>
<td>4241</td>
<td>1175</td>
<td>21807</td>
<td>16875</td>
</tr>
</tbody>
</table>

Source: Minister’s Office for Research and Special Studies, MWRI 2009
2.3. REVIEW OF CURRENT POLICY AND INSTITUTIONAL REFORMS

The proceeding review of the considerable challenges facing Egypt’s water sector indicates the need for attention to the reform of water policies and programs and their institutions to improve the basis for sustainable management of the country’s most important natural resource. A few years ago, attention was mainly given to water supply management. At present, integrated water resources management, which seeks an efficient blend of all available resources (fresh surface water, groundwater, precipitation and drainage water) to meet demands of the full range of water users (including agriculture, municipalities, industry and in-stream flows) is becoming an integral part of MWRI’s policy vision to meet these challenges. A more integrated management approach requires much closer coordination among concerned government institutions and the active participation of water users in planning, management and operation of water collection and distribution systems. It also necessitates the establishment / enhancement of the legal basis for water allocation, conservational and protections as well as user participation in water management. Training and capacity building of the MWRI and other stakeholders are also essential to face these challenges, and to be able to manage the ongoing, as well as the anticipated reform activities of the water policies.

To cope with these challenges, the MWRI has developed a national policy with three major pillars of: 1) increasing water use efficiency; 2) water quality protection and pollution control; and 3) water supply augmentation. The MWRI has also initiated over the past few years various activities in collaboration with different donor organizations designed to revise and update water policies and to strengthen key institutions.

Table 2.2 through 2.5 provides summaries of these policy initiatives classified into four categories: Participating Irrigation Management (PIM); Institutional Development and Organizational Strengthening (IDOS); Water Quantity Management (WM); and Water Quality Management and Pollution Control (WQMC). The tables present status, support required and potential constraints to implementation in simplified format.
## Table 2-2 Participatory Irrigation Management (PIM)

**GOAL OF POLICY GROUP:** Improve water use efficiency and achieve system cost sharing through decentralized, private sector participation in the control, operation and maintenance of the Nile River Irrigation Systems at levels below the main water delivery system.

<table>
<thead>
<tr>
<th>POLICY INITIATIVE (Supporting Donor)</th>
<th>GOAL</th>
<th>PRESENT STATUS</th>
<th>REQUIRED SUPPORT MECHANISMS</th>
<th>POTENTIAL CONSTRAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Water User Associations in non-IIP areas. (USAID/WPRP)</td>
<td>Promote expansion of PIM at the <em>mesqa</em> level, provide for PIM at higher levels, and institutionalize Irrigation Advisory Service (IAS) to support <em>mesqa</em>-level WUAs.</td>
<td>IIP &amp; IIIP are expanding <em>mesqa</em>-level WUAs, WPRP and others have created higher-level apex organizations, and IAS has been institutionalized &amp; fully operational.</td>
<td>Revised Law 12 approved.</td>
<td>Financial resources.</td>
</tr>
<tr>
<td>b. Formation of WUAs at distributary and branch canal levels. (USAID/WPRP)</td>
<td>Promote PIM at levels higher than <em>mesqa</em> (apex organization)</td>
<td>Three-branch canal WUAs established.</td>
<td>IAS enhanced with additional staff, physical resources, and increased operating budget.</td>
<td>Lack of staff to effectively combine efforts into a coherent program and expand it nationwide.</td>
</tr>
<tr>
<td>d. Irrigation Management Transfer (USAID/WPRP)</td>
<td>Transfer management of selected sections of the irrigation system to stakeholders and/or the private sector.</td>
<td>Four pilot BCWUAs formed, MOU signed and transfer awaiting system rehabilitation.</td>
<td>IAS enhanced with additional staff, physical resources, and increased operating budget.</td>
<td>Lack of staff to effectively combine efforts into a coherent program and expand it nationwide.</td>
</tr>
<tr>
<td>e. Water Boards Program (Netherlands)</td>
<td>Promote PIM at the secondary (branch canal) level including integrating water management across users and functions.</td>
<td>8 water boards established and functioning, 2 additional WBs are in process of establishment &amp; expansion to the District level is in planning.</td>
<td>8 water boards established and functioning, 2 additional WBs are in process of establishment &amp; expansion to the District level is in planning.</td>
<td>Lack of effective and acceptable method for WUA to become self-financing.</td>
</tr>
<tr>
<td>f. Fayoum Water Management Project (Netherlands)</td>
<td>Improve water distribution &amp; drainage.</td>
<td>32 water boards established, IAS in Fayoum area strengthened, a federation of 22 WBs is being established, and integrated water management concept established and tested.</td>
<td>32 water boards established, IAS in Fayoum area strengthened, a federation of 22 WBs is being established, and integrated water management concept established and tested.</td>
<td>Effective public awareness campaign.</td>
</tr>
<tr>
<td>g. Institutional &amp; Technical Support Program (Netherlands)</td>
<td>Enhance capacity of IIP/ADP to perform its tasks in an effective way in a changing institutional environment.</td>
<td>Enhancement of drainage committees to achieve participatory drainage management, through WBs and prepared a methodology and procedure to increase farmer participation in drain management.</td>
<td>Enhancement of drainage committees to achieve participatory drainage management, through WBs and prepared a methodology and procedure to increase farmer participation in drain management.</td>
<td>Effective public awareness campaign.</td>
</tr>
<tr>
<td>h. Irrigation Improvement Project &amp; Integrated Irrigation Improvement Management Project (World Bank)</td>
<td>Increase farmer participation and cost sharing; improve irrigation and drainage efficiency; and improve environmental situation.</td>
<td>IIP expanding IIIP, in the services procurement phase.</td>
<td>IIP expanding IIIP, in the services procurement phase.</td>
<td>Effective public awareness campaign.</td>
</tr>
</tbody>
</table>
### Table 2-3 Institutional Development & Organizational Strengthening

**GOAL OF POLICY GROUP:** Enhance and strengthen the organization and staff capacity of MWRI to function and effectively in its’ changed future role.

<table>
<thead>
<tr>
<th>POLICY INITIATIVE (Supporting Donor)</th>
<th>GOAL</th>
<th>PRESENT STATUS</th>
<th>REQUIRED SUPPORT MECHANISMS</th>
<th>POTENTIAL CONSTRAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Public Participation in Decision Making (USAID/WPRP)</td>
<td>Include public &amp; stakeholders in the MWRI decision-making process to achieve transparency, improved awareness and better decisions.</td>
<td>The MWRI organizational structure has been defined and one internal awareness workshop has been conducted for field staff in four Directorates.</td>
<td>Staff capacity building through effective training. Support of cabinet and PA in timely manner.</td>
<td>Availability and capacity of staff.</td>
</tr>
<tr>
<td>b. Integrated water management functions at the District level (USAID/WPRP)</td>
<td>Integrate all MWRI irrigation and drainage functions and water sources at the District level into an integrated management scheme.</td>
<td>Implementation of two pilot Districts is underway with: Plan prepared. Common boundary for irrigation and drainage approved. District officers named.</td>
<td></td>
<td>Financial resources</td>
</tr>
<tr>
<td>c. Irrigation Advisory Service institutionalized (USAID/WPRP)</td>
<td>Develop an effective IAS to support development and sustainability of water user associations.</td>
<td>IAS has been established and provided with staff and budget.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Ensure legal basis exists for implementation of all MWRI policy reforms (USAID/WPRP)</td>
<td>Revise law 12 to be consistent with MWRI vision for PIM and other policy reforms.</td>
<td>Revised Law has been approved by MWRI and submitted to the cabinet for review and approval.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Enhance Nile forecasting center to support strategic development and management decisions within the context of the Nile Basin Initiative (Netherlands/LNDFC)</td>
<td>Improved ability to analyze HAD operations in light of climate change, national policies and the goals of the Nile Basin Initiative.</td>
<td>Implementation of improved facilities and modeling capability is underway with scheduled completion in 2004.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Enhance capacity of EPADP to perform its tasks in an effective way in a changing institutional environment (Netherlands/INTESP)</td>
<td>Integrate drainage with other services at the District level, and promote stakeholder participation.</td>
<td>Drainage is now integrated with other services at the District level; Drainage Committees are being established where no WUAs exist; and farmer participation is being promoted in O&amp;M through Water Boards.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Institutional Reform Unit (Netherlands/IRU)</td>
<td>To coordinate, increase awareness and acceptance of and assess the affects of institutional reform efforts presently underway. To support, monitor and evaluate ongoing efforts of decentralization and PIM.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2-4 Water Quantity Management

GOAL OF POLICY GROUP: Improve water use efficiency in order to meet growing demands without introducing adverse impacts on agricultural production

<table>
<thead>
<tr>
<th>POLICY INITIATIVE (Supporting Donor)</th>
<th>GOAL</th>
<th>PRESENT STATUS</th>
<th>REQUIRED SUPPORT MECHANISMS</th>
<th>POTENTIAL CONSTRAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Improved, real time information exchange between MWRI &amp; MALR regarding cropping pattern and water deliveries (USAID/WPRP)</td>
<td>To match irrigation water deliveries with crop demands under the “free cropping” policy.</td>
<td>National implementation is presently underway with approximately 40% of Egypt’s irrigated area presently using MISD.</td>
<td>Training. Interministerial cooperation /coordination.</td>
<td>Lack of legal basis. Number and capacity of staff. Financial resources. Political will. Ground Water Quality. Size of landholdings.</td>
</tr>
<tr>
<td>b. Substitutes short duration rice varieties for long duration varieties (USAID/WPRP)</td>
<td>To reduce water utilization of rice.</td>
<td>Implemented nationwide.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. Improved irrigation practices traditionally used to cultivate sugar-cane. (USAID/WPRP)</td>
<td>To reduce water utilization of sugar cane.</td>
<td>New practices have been pilot tested on approximately 100 feddans and approximately 1,100 feddans are presently using improved practices. MWRI is presently producing low cost inputs to cover an additional 2,000 feddans.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Transition from water level-based water distribution to distribution based on volume. (USAID/WPRP)</td>
<td>To improve accuracy of water distribution to minimize over and under measurement of water deliveries.</td>
<td>Division points between Directorates now are using volume-based distribution and implementation within Directorates is underway nationally.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Increase the reuse of drainage water to expand effective supplies. (USAID/WPRP)</td>
<td>To maximize the utilization of drain water conjunctively with surface and groundwater supplies.</td>
<td>Intermediate drain reuse is underway at 20 new locations according to revised selection criteria.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>f. Optimize the utilization of free flowing groundwater in the Western Desert. (USAID/WPRP)</td>
<td>To reduce inefficient use of these water resources and minimize the damage to soils caused by inefficient and degrading practices.</td>
<td>Flow from wells in the Farafra area has been controlled and storage provided for excess flows.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improve overall water use efficiency, integrate irrigation water sources with each other and with drainage, and implement cost recovery. (IBRD/IIP and IIIP)</td>
<td>To rehabilitate physical systems, remove water supply constraints, improve environmental conditions, increase farmer participation and recover costs.</td>
<td>50% of the World Bank funded IIIP program has been implemented and the IIP program is presently in the procurement stage.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Ensure sustainable use of existing groundwater sources &amp; develop additional groundwater sources. (Netherlands/GSP)</td>
<td>To develop strategic groundwater plans on a national and regional level, develop the organizational structure and staff capacity to implement and manage a sustainable groundwater management plan.</td>
<td></td>
<td>A revised organizational structure has been defined and institutionalized, guidelines for planning prepared, and training is underway.</td>
<td></td>
</tr>
</tbody>
</table>
**Table 2-5 Water Quality Management & Pollution Control**

**GOAL OF POLICY GROUP:** Control pollution sources in a sustainable manner to maintain water quality at levels that meet standards for their intended use.

<table>
<thead>
<tr>
<th>POLICY INITIATIVE (Supporting Donor)</th>
<th>GOAL</th>
<th>PRESENT STATUS</th>
<th>REQUIRED SUPPORT MECHANISMS</th>
<th>POTENTIAL CONSTRAINTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Ensure legal basis exists for effective WQ management (USAID/WPRP)</td>
<td>Revise Law 48 to modify effluent discharge standards, update &amp; redefine the role of stakeholders.</td>
<td>Revisions to the law approved by MWRI but not yet sent to Cabinet.</td>
<td>Inter-ministerial cooperation/coordination.</td>
<td>Lack of appropriate legal basis (law 48 in its present form is out of date with present conditions/requirements. Number and capacity of staff. Weak capability for enforcement. Apparent overlap of legal responsibilities among various ministries. Reluctance to share data within MWRI and between ministries.</td>
</tr>
<tr>
<td>b. Include environmental considerations in all MWRI activities. (USAID/WPRP)</td>
<td>To integrate the environmental dimension, including EIA in all MWRI activities/projects.</td>
<td>A guidebook for preparation of EIAs has been published in English and Arabic and an organizational mechanism defined for implementation.</td>
<td>Financial support. Training. Improved donor coordination. Effective public awareness campaign.</td>
<td></td>
</tr>
<tr>
<td>c. Improved management of urban wastewater (USAID/WPRP)</td>
<td>To beneficially utilize urban wastewater through: - Prioritization of wastewater treatment plants (WWTPs); - Improve performance of existing WWTPs; - Classification of drains by water quality; - Wastewater irrigation and health awareness; - Wastewater quality and regulatory development; - Promote intermediate reuse of drains; - Enhance drainage water quality monitoring; - Restrict irrigation use of urban wastewater for food crops; - Wastewater irrigation for desert forests; - Wastewater irrigation of urban green lands; and - Enhance inter-ministerial cooperation.</td>
<td>An agreement with NOPWASD has been reached to prioritize construction of wastewater treatment plants based on revised technical considerations; &amp; pilot demonstrations have been carried out for: - Use of treated urban wastewater to irrigate ornamental trees in urban areas and along highways; - To test industrial wastewater management strategies; and - To establish a drain classification system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>d. Develop and implement a sustainable WQ management and pollution control plan. (Netherlands/SWQU)</td>
<td>To develop a sustainable WQ management and pollution control plan including criteria for EIA, public awareness campaign and a standardized surface water quality monitoring system.</td>
<td>A Water Quality Unit has been established by Ministerial Decree, and the Unit is being formed &amp; was made functional in late 2002.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>e. Improve WQ information systems to support improved WQ management &amp; pollution control. (Canada/NAWQAM) (Netherlands/MADWQ)</td>
<td>Strengthen institutional capacity for W.Q. management and enhance coordination/participation of stakeholders.</td>
<td>The water quality-monitoring network has been expanded &amp; upgraded &amp; a water quality data management system has been established.</td>
<td>Strong public resistance to individual participation in environmental protection. Financial resources.</td>
<td></td>
</tr>
<tr>
<td>f. Improved Wastewater Reuse Practices (USAID, LIFE/IWRM)</td>
<td>To provide technical assistance guidelines, and commodity support for a demonstration site for using treated wastewater for irrigation a variety of commercial crops in accordance with “ the Egyptian code for Reuse of Treated Wastewater in Agriculture.”</td>
<td>10 feddans demonstration site was officially established in Luxor Regular Comprehensive Environmental Monitoring of water soil and plants was carried out.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>g. Wastewater Reuse (USAID, IWRMII)</td>
<td>Increased economic returns to treated wastewater, either as refineries into drainage canals and the Nile River or as inputs into the cultivation of crops and for plants, in accordance with existing or revise waste water reuse standards.</td>
<td>Prepare a feasibility study that elaborates alternatives uses for treated wastewater; determine costs and benefits of alternatives, and recommends a strategy for maximizing economic returns to treated wastewater.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. Twining Project (EU) assists the MWRI in improving the management of the quality of water resources through transferring the EU experience and best practices into the National Water Resource Plan.</td>
<td>To deliver support in developing action to assess and improve water quality to contrast pollution from point and diffuse source, to reduce pressure and impact on receiving bodies (Nile System) from Agriculture, industry, and households and to combine water quality and quantity management.</td>
<td>The following results are accomplished: Report on the assessment of the Egyptian Water quality regulatory framework and institutional capacity. Technical guidance documents on agreed methodologies and procedural tools to improve the regulatory framework.</td>
<td></td>
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</tr>
</tbody>
</table>
2.4. NEEDS FOR MWRI ORGANIZATIONAL RESTRUCTURING

Water policy makers encounter a very intricate situation that needs a strenuous effort to overcome the problem of quantitatively and qualitatively limited water resource base. With growing demands by the various sectors (agriculture, industry, river navigation and municipalities) the problem gets more aggravated by the deterioration of water quality, resulting from draining various types of wastes into the irrigation and drainage networks. The problem, as such requires greater awareness and collaboration between MWRI officials, water users and any other related organizations.

Around the world, national water resource agencies are responsible for the key functions in managing a nation's water resources. Normally these functions include planning (long range, new project planning and program planning); design of facilities; construction activities; operation and maintenance of water storage, delivery and drainage facilities; and regulation of the use of surface and groundwater. How a water resource agency is organized and managed determines how efficiently and effectively it carries out its functions.

MWRI (originally was called Ministry of Public Works) was one of the first ministries founded in Egypt with more than 200 years history. It has been effective in adapting to changing circumstances. When it was founded, water supply varied according to the floods on the Nile River, because there was inadequate storage in the system to provide year-to-year consistent water supplies. Management of water resources at that time was considerably different than it is now. After construction of the High Aswan Dam, a dependable year around water supply was created. New adapted management procedures were adopted by MWRI now, as municipal and industrial water use is increasing and irrigation use is expanding because of the horizontal expansion program. MWRI again needs to re-assess and perhaps change its water resource management of the country's water resources.

The question addressed in this section is whether management practices and organizational structures developed to deal with past conditions are adequate to meet future challenges in the management of Egypt's water resources.

The MWRI is presently decentralizing decision-making to the field officers, transferring certain O&M activities to the private sector and encouraging stakeholder input into decision making. One possible result of the continuation of these activities is that the Ministry will transform into an organization that is responsible for planning water allocation strategies at the macro scale, O&M of the main water conveyance system and enforcement of laws and regulations that deal with water quality protection. If this scenario is accepted then the Ministry must prepare an appropriate strategy for dealing with this transition and remaking itself to the future vision. This strategy is based on a set of percepts, which have generally come to be accepted in Egypt.

- The government's overall water resources management policy is aimed at sustainable economic growth through enhancing the role of the private sector in provision
- National water security demands that the main supply facilities and allocation of supply among competing uses must remain under the control of MWRI
- Decentralization and privatization of water management to the appropriate level will result in increasing water use efficiency,
• Regulation and enforcement of sustainable practices in water management (both supply and demand sides) must remain as a mandate of MWRI

• Water quality protection and pollution control is essential for sustainable water management practices,

These percepts, among others, have apparently been embraced by top management of MWRI and provide the foundation of various manifestation of MWRI's vision for the future demonstrated by the policies and programs adopted by MWRI when taken as a whole and provide a solid basis for the Ministry and its partners involved in the water sector to transition to a more integrated, decentralized and participatory approach to water management

2.5. FUTURE VISION FOR WATER RESOURCES IN 2050

A Workshop for "Preparing the Future Vision for Managing Water Resources till 2050", has been held in January 2009, attended by a number of experts from the Ministry of Water Resources and Irrigation and those concerned with water subjects internally, externally, and internationally.

The Ministry is implementing now the National Plan for Managing Water Resources till 2017, and Joint Committees have been held with the concerned Ministries and different governorates to determine the present and future water requirements for different sectors. The future strategy till 2050, will be built upon a number of different scenarios, especially for the difficulty of predicting the future economic and climatic changes accurately. Also, water situation in 2050 and before, cannot depend only on the present water resources because of increasing needs due to enormous increasing population, hence, additional water resources must be found.

One of the most future vision supporters is that the State must adopt a National Program to rationalize water requirements in different sectors and evaluate the return of each program periodically. Evaluating the return of water usage in different sectors is a must, in addition to reducing the cultivation of crops glutinous for water, together with the necessity of dealing with the subject of water desalination, whether high saline water or seawater seriously. Pollution subject should be considered as a danger that threatens water security safety, which necessitates the execution of a National Program to deal with its causes as soon as possible.

In addition, asserting the importance and necessity of increasing water awareness on the ordinary citizen level to increase his awareness with water importance, and the seriousness of Egyptian water situation and its dangerous future if we do not pay attention to rationalizing consumption in all fields.

One of the most important pillars of 2050 vision is enhancing the fruitful co-operation among Nile Basin Countries in all water, agricultural, energy, economic and commercial fields. This will bring developmental benefits to all Basin Countries in the light of what is owned by these countries of enormous water capacities that have not been used yet.
3. HUMAN RESOURCES DEVELOPMENT STRATEGY

3.1. HUMAN RESOURCES DEVELOPMENT IN THE MWRI

Training and human resources development constitute one of the important dimensions of strengthening institutional capacity for improved managements of the operations of the MWRI. Achieving the objectives of a comprehensive human resource development in the Ministry is a long term process. Training constitutes one of the components of such a comprehensive program. This chapter focuses on human resources development strategy objectives and elements.

The main objectives of a human resources development in MWRI are:
- Individuals growth;
- Integrating the objectives of individuals and those of the Ministry;
- Attracting competent calibers to work in the Ministry;
- Increasing the clarity of career paths to all engineers, researchers, specialists and administrators;
- Correlating between career prospects and training and individual development; and
- Developing objective performance appraisal and incentives systems.

3.2. CAREER PLANNING AND DEVELOPMENT

Human resources development strategy is based on the information of career planning and development system which is a comprehensive approach consisting of all the components and systems of human resources management as illustrated in fig.3.1

Career consists of the types of jobs held by an individual throughout his/her life, in addition to the individual’s attitude to these various experiences and feeling towards the various jobs and organizations, as well as the degree of success and achievements attained.

Career planning refers to identification of the ultimate goal of the career through which the objective of every stage and the activities and directions necessary to achieve these objectives can be identified. Career planning depends on two major factors:
- Individual initiatives.
- Ministry’s contribution in career planning and follow-up accompanied by clarification of the paths of the various jobs.
OBJECTIVES OF STRATEGIC HUMAN RESOURCES MANAGEMENT

- Effective Work Force
- Work Environment Quality
- Building for the Future

Job Analysis Information

Human Resources Planning

Recruiting

Performance Appraisal

Training & Development

Career Planning

Organizational Development

Figure 2 Interaction of the Human Resources Management Systems
3.3. ELEMENTS OF THE HUMAN RESOURCES DEVELOPMENT STRATEGY

Diagnosis of the situation for human resources development has highlighted the importance of developing human resources through the development of the following elements.

- Staff recruitment:
  - Dependence on the human resources planning policy (selection of appropriate number, required quantities, right timing)
  - Consistency with the general policy of the MWRI.
  - Based on coordination between the Ministry’s organization objectives and individual’s objectives.

- Recruitment policy has two major corner stones:
  - Internal recruitment: which indicates transfer and promotion as a part of developing career path, and as a result of complementarily between the work systems and the human resources development.
  - External recruitment: This indicates the methods, procedures and selection criteria with job descriptions and remuneration system.

- Capacity building

This component of the human resources development strategy deals with the building of Ministry capacity as an organized and continuous process based on employees. The objective of this process is to create specific technical, administrative behavioral and attitude changes in order to meet the present and future needs of the Ministry. Capacity building is classified into two divisions, i.e. training and self-growth.
• Training

Training is a crucial part of human resources management. It consists of a number of components constituting objectives, policies, procedures, plans and follow-up and evaluation.

These components reflect the importance of training activities and procedures manual in the Ministry with clear assignment of responsibilities. Furthermore, the human resources development strategy should take into consideration the Ministry’s role on providing national and international training services on its activities in order to satisfy the demand for such activities undertaken by the Ministry.

• Self growth:

As major component of capacity building, special attention should be given to the Ministry’s staff self-growth activities, which include:

- Regular scientific sessions to discuss specific subjects. External experts could be invited.

- Quarterly meetings to discourse the most important events that faced the unit, prospective projects and status of on hand projects.

- An internal scientific magazine in which summarizes of the most important studies and researches undertaken by the unit are published.

- Assisting staff to acquire higher academic degrees through affiliations with universities and assisting in supervision, etc…

- Providing scholarships and assignments abroad.

• Staff Performance Assessment System

Despite the variety of uses or the results of the performance assessment system and the different correlations between the activities constituting the human resources management system, we can consider the ultimate objectives of the system to be: improving individual performance and improving the working environment in the Ministry. These objectives can be achieved through the identification of development needs and requirements on the individual, team and institutional levels.
Figure 4 Objectives of the Staff Performance Assessment System

The appropriate criteria for staff performance assessment system comprises:

- **Time criteria:**
  - Historical performance
  - Future performance

- **Classification criteria:**
  - Absolute appraisal in the light of general criteria
  - Comparative appraisal with others in the same job

Assessment responsibilities include:
- Who undertake the appraisal
- Reducing risks and drawbacks facing appraisal
- Reducing personal biases
- When to undertake performance assessment
- Training and development of appraisers

A staff performance manual is to be prepared containing:
- Assessment procedures and responsibilities
- Performance appraisal forms
- Use of performance appraisal results.

- **Incentive System**

The incentive system aims at the following:
- Justice in distribution of incentives
- Attracting special calibers to the Ministry.
- Creating performance enhancement.
- Consideration of the nature of work in the Ministry.
- Including financial and moral aspects.
- Directly related to the staff performance assessment system.

Fig. 3.4 illustrates the Objectives of the Incentive System.

Figure 5 Objectives of the Incentive System
The criteria of the incentives system are:
- Covers all jobs in the Ministry
- Includes individuals/groups
- Considers both seniority/effectiveness
- Considers the type of job: supervisory/non-supervisory
- Encourage initiative and development in:
  # Methods of undertaking jobs
  # Reducing waste
  # Developing applications
  # Simplifying procedures

• Personal Information System

This is a support system to the human resources development strategy enabling efficient management of the four components of the strategy aforementioned. Furthermore, it ensures the continuity of the system. The personal information system depends to a large extent on the establishment of databases, which would provide reports that would assist in the decision-making process in the various fields of human resources development with special reference to:
- Training reports (needs, programs, conference, evaluation…etc)
- Personnel affairs reports (performance appraisals, salaries, vacations, penalty…etc)
- Career movement reports (recruitment, hiring, transfer retirement, promotion…etc)

3.4. HUMAN RESOURCES DEVELOPMENT: THE PRESENT SITUATION

The information appearing in this report, are result of several meetings and discussions with the Departments Heads of the MWRI. The planning for such meetings has been made by IWMU and the members of the study team. The aim of this section is to assess the present situation with respect to the various components related to human resources development. The method followed in the assessment is based on structured interviews to get opinions on: Diagnosing the present situation in the Ministry to human resources development, from the following factors:

• Recruitment
• Promotion
• Short-term training
• Academic training
• Incentive systems
• Performance appraisal system
• Recruitment system

Recruitment

There exists no special recruitment system for the Ministry’s staff and NWRC institutes but rather a general system for both. The general procedure for recruitment is as follows:
• Each head of department (technical, research and administration) identifies his/her needs.
• All needs are reviewed and approved by the chairman of the sector or director of institutes who integrates them and sends list officially to minister’s office or chairman of NWRC.
• All needs are classified and approved. After approval from the Central Authority for Management, the vacancies are advertised in the newspapers.

• There is a permanent committee formed headed by one of the undersecretaries to meet and select the new members.

• Normally, the department cannot get what it has required due to the lack of vacancies.

**Promotion system**

The promotion system that is applied to the Ministry’s staff follows the general regulations. Two systems can be distinguished, a system for the technical and administrative staff (law no. 47 of 1978) and a system for the research staff (universities).

The promotion applied to the technical and administrative staff is based on the number of years spent in the job, and on performance appraisal.

The promotion system applied to the research staff is based on the fulfillment of a minimum number of years (5 years) between each job and the next and the satisfaction of a number of published papers.

**Short-term training**

The training Center of the Ministry of Water Resources and Irrigation (TC) at 6 October city was established in 1994. The Center’s goal is to develop the skills of the MWRI professional and non-professional staff to improve their on-the-job performance. This is done through well-structured training courses, seminars, conferences, etc.

The national programs of TC are mainly classified into (Annex A):

• Scientific and technical programs for engineers and technicians.

• Management and administrative courses.

• Computer and English language courses.

• Field studies, practical and laboratory training.

• Workshops, seminars, conferences and other technical activities.

**Academic training**

The situation of Academic training in MWRI may be summarized in the following:

• No clear training plan exists for the various levels and categories

• A preliminary training needs assessment has never been achieved and followed.

• With respect to the selection of high-level academic training including seminars and special training programs outside the country, it is determined by heads of MWRI departments or directors of NWRC institutes.

• A note is sent periodically to the heads of MWRI departments concerning academic training plan of the Ministry. Most of the time the heads of departments do not send the staff due to the workload or irrelevance of the training.

• As the resources required for offshore academic training are considerable, qualifying for and selection for off-shore training should be on a competitive basis.
• The NWRC library and information system are rich with information and data concerning Egypt’s water resources. Such information cannot be found elsewhere with level of accuracy and scientific base. Accordingly many graduates prefer to join the NWRC to finish their postgraduate studies. Nevertheless, the research plans of NWRC Institutes are not clear to the research staff. This makes it difficult for them to improve and share in the development of subjects for their academic studies.

• Ph.D. programs are planned on 4-5 years and are based on the long-term objectives of research institutes. For M.Sc. degree a two-years program might be adequate.

• The inclusion of many universities in the academic training proved to support the Ministry staff effort to establish international scientific knowledge.

Incentive System

Basic salary levels are not as high as desired for government employees in general. Employees of the Ministry of Water Resources and Irrigation are not different. However, the ministry works out a package of direct and indirect incentives to compensate the employees and keep the good ones on board. This package includes direct incentive system that is paid on monthly and quarterly basis. Additionally, all ministry permanent staff gets an annual bonus, which is related to their employment grade and performance. On the other hand, ministry staff get compensated for works and studies done for other government entities and government sector. The indirect incentives include nomination for short and long term training courses within and outside the country. Distinguished professionals get the chance to participate in local and international conferences and workshops.

Performance Appraisal System

Performance evaluations are normally done annually in writing. The form used is a subjective evaluation rather than an evaluation related directly to employee output of specific tasks. Personal conferences between the employee and the supervisor concerning the written evaluation are apparently rare. Almost everyone gets a high rating regardless of actual performance.
4. . TRAINING NEEDS ASSESSMENT

4.1. DEFINITION OF A TRAINING NEED

A training needs assessment is the first and perhaps most important step in designing human resource development initiatives within the MWRI. All subsequent steps in preparing instruction are based on its outcome.

- Academic training
- Incentive systems
- Performance appraisal system

Basically, a training need could be characterized as a gap between desired and actual job performance that results from an individual’s lack of knowledge, skill or appropriate attitude. It differs from non-training needs which can never be addressed solely by training efforts.

In any organization there are two general types of needs:

- Those stemming from existing or expected deficiencies in individual knowledge, skills or attitude. These are instructional needs, and they can be met through training, education and development strategies.
- Those stemming from cause other than knowledge, skill or attitudinal deficiencies. Called non-instructional needs, they include inadequate or ill-conceived reward system, organizational/job designs or supervisory practices.

Instructional needs can be classified into three types:

- Training needs are linked to specific job or role requirements with immediate applicability.
- Educational needs are more general than their training counterparts. They are linked to efforts intended to prepare individuals for possible future job requirements or realization of career plans.
- Development needs are most general, linked to overall improvement of the individual over a long time period. To Ministry decision makers, developmental needs should be important factors in achieving strategic plans, since they present the future talent requirements of the Ministry viewed in their totality. Any strategic implies the long-term application of particular kinds of knowledge, skills and attitude.

4.2. TRAINING NEEDS ASSESSMENT OBJECTIVES

The operational objective is to find out what the employees need to be taught to perform the job at the desired levels. Accordingly the following objectives apply to this study:

- To analyze the entire Ministry isolating the “whereas” of training or the employee segments in need of training.
• To collect data on the knowledge, skills and attitudes (KSAs) required for successful job performance.

• To determine how the employees actually stand with respect to the desired KSAs.

• To compare the required with the actual to yield information about the objectives to be obtained through training.

There are four distinct stages to conducting TNA. The four stages are listed in the same order they appear as objectives:

• Organizational analysis: the unit of analysis is the entire Ministry and the sources of determining the “where” of training are Ministry goals and objectives; human resources inventories (manpower)

• KSA requirements: the unit of analysis here is the job or jobs that are identified as deserving attention through organizational analysis. This involves establishing criteria to determine successful job performance. Normally the first step here is job description. This is then used to arrive at the KSAs needed for successful job performance. However, in the case it is doubtful whether job descriptions, if they exist at all, will be sensitive enough for this purpose. Therefore, interviewers will need to be trained in how to assist supervisors/managers in defining the criteria which define the desired performance standards for a particular job.

• Person analysis: this step is concerned with finding out how employees stand with respect to the desired criteria (KSAs). This is done by matching the required KSAs with the assessment of employees provided through performance appraisals; working sampling, interviews, specially designed questionnaires, tests of job knowledge, proficiency and achievement.

• Training objectives: after comparing desired with actual performance the objectives to be attained through instructional methods can be determined. These can be stated in terms of KSAs (e.g. improve specific competencies) or in terms of outputs (e.g. increase efficiency by 3% by a certain date after completion of the training period)

4.3. **KEY STEPS IN CONDUCTING TNA**

The steps in carrying out the instructional needs assessment are as follows:

• Identifying Issues, Problems and Opportunities

  • This is organizational analysis where the focus is on the entire Ministry to determine the “where and for whom” of training needs. Basically there are three different ways to gather data during an organizational analysis:

  • React to problems as they occur.

  • Seek out potential problems or opportunities.

  • Be selective, reaching to some issues while anticipating others.

• Collecting Background information

  • Once a problem or opportunities has been identified as part of the organizational analysis more information should be collected to:

  • Verify that it exists.

  • Learn more about the issues involved.

  • Suggest ways of assessing training needs and collecting data.
Any of the sources of information listed below may be consulted for this purpose (if available).

A. Organization data for determining training needs
   • Ministry goals and objectives.
   • Manpower studies.
   • Analysis of efficiency indices from the authorities.
   • Changes in systems or technology.
   • Management requests.

B. Job data
   • Job description.
   • Job specifications.
   • Performance standards.
   • Ask questions about job.
   • Training committees.

C. Techniques for determining training needs
   • Performance data.
   • Observation-work sampling.
   • Interviews.
   • Questionnaires.
   • Tests.
   • Attitude surveys.
   • Rating scales.

Identify Relevant Criteria

A training need is a gap between past or present and desired future job performance that results from inadequate individual KSAs requirements. To identify such a need it is first necessary to know what conditions ought to be. Here is where criteria for desired performance come into play. There are two major types:

• Formal criteria are widely communicated production quotas efficiency measures, work standards or other objective measures of performance.

• Informal criteria may not be widely communicated. They include opinions of supervisors, competent employers, and others about the way jobs and tasks should be done and the results that should be expected. Though subjective, they are probably more common than their more objective counterparts.
Potential training needs are the result of comparing actual performance with relevant criteria (work standards of desired future performance levels). A training need exists when an employee lacks the KSAs to perform an assigned task satisfactorily. This implies that there are standards of performance. That may or may not be true. Not every Ministry Authority has established standards for every task and lots of standards have been informally established, but never documented. If there are no standard against which employee performance can be measured, it is very hard to conclude that the employee is not performing properly. This situation can occur frequently when managers are dissatisfied with employee performance but have not identified precisely what level of performance would satisfy them.

**Selecting a Data Collections Method**

There are basically four methods of data collection:

- Performance analysis, which begins the needs assessment by determining the desired process and job output and then determining the tasks required for each job output and ultimately what KSAs are required to perform the various tasks.

- This approach to training needs assessment links KSA requirements to job performance.

- Task analysis, begins by determining the tasks performed by the employees and then ascertaining what KSAs are required to successfully perform those tasks.

- This approach is output focused but does not tie directly into job performance.

- Competency Study, begins by determining what “experts” in the job classification thought the competencies or capabilities of an employee within that job classification were and then ascertaining what KSAs are required to have the capabilities or display the competencies. This approach does not directly link the training input to performance output or address the performance context of the trainee.

- Training needs survey, begins by survey a range of informed sources and asking that training they think is required by a group of employees. This is basically an informed opinion survey which is relatively quick but makes no direct link to performance output at any level.

The collection of which data collection method will depend on the following factors:

- The size and type of employee population.

- The complexity of the jobs in question.

- Is it a ‘quick fix” or will be a multi year training plan?

- The constraint on resources-staff, money and time.

- Ministry commitment to examining job performance issues – Do they want improved performance or some training “flash”?

**Comparing Data on Conditions with Relevant Criteria.**

There is a distinction between merely collecting data about existing performance and developing criteria for desired performance. The whole point of training needs assessment is to identify the gaps between what people do and what they should know, feel or to be able to demonstrate. One group of assessment methods can collect information about both – for example – surveys and interviews. Another group of assessment methods can identify criteria only – for example – task analysis and
competency studies. A third group can identify only existing conditions, while criteria must be inferred or supplied from other sources – for example – employee performance data. At some point conditions and criteria must be compared to identify training needs. How that comparison should be made depends on the method(s) of assessment selected.

**Reporting in Training Needs.**

Needs assessment does not end when data have been collected and analyzed; rather the presentation of results is crucial because it provides the basis for subsequent decisions. Therefore, the process of reporting results is at least as important as collecting and organizing the data.

### 4.4. CATEGORIES OF TRAINING

“Training” encompasses a wide range of planned activities designed to strengthen the performance of managers and staff. Four types of training that would be in a systematic training plan as proposed by these guidelines, and their relevance to different situations, are presented below. The distinctions among them are rather arbitrary and in some respects they overlap.

**In-Service Short Term Training**

That is intended to maintain staff skills at given levels of proficiency. It may be called short term or on the job training for existing or new staff members. Its objective is to strengthen the technical skills of staff when they join the ministry or are to be upgraded. In-service training is not usually intended to impart more skills than are required for the position currently held. It may be used to satisfy continuing or increased staff proficiency within the same career path. In-service training is closely linked to the vocational training staff usually receives as part of the pre-service, formal education, which qualifies them for employment. At the time employees first join the MWRI, their skills should be assessed and recorded. New employees should then be listed for the particular in-service training activity or activities, which address their shortcomings. This procedure may be repeated periodically to keep staff abreast of their fields and closely responsive to the requirements of senior management.

In-service training frequently is seen by staff as a path to promotion. When this happens it often becomes only a tool for personnel management rather than as a means to improve performance. At worst, in-service training is used temporarily to relieve operating units of unsatisfactory staff.

**Adjustment or Reorientation Training**

This may be required following changes in policy or technology when MWRI staff may be called to undertake new jobs for which they are not adequately prepared. Irrigation staff are increasingly expected to bring farmers into compliance and participation in water related matters. For the success of this and many other examples of change, training must be redefined to bring staff capabilities in line with new MWRI objectives. This is adjustment training.

Adjustment training is usually carried out through one or more of three formats:

- **Specialist training** is short term and may be carried out through special courses at local institutions, Regional or international experts may be brought in to supplement local experience, if needed. Study tours are an example of specialist training for adjustment purposes.

- **Refresher training** is a course of study in the staff person’s field of basic qualification that will introduce new concepts as well as reinforce earlier training. The refresher training should focus on the skills needed to perform the newly designed job properly: Refresher training is usually of relatively short duration and includes some theoretical background.

- **Retraining** is needed when a staff member is moved from one type of job or career stream to another. This frequently happens when there is a significant shift in the mandate of the
department, or when certain phases of organizational are complete. Some irrigation departments have retrained design staff to operate irrigation systems when a permanent slowdown in new construction is anticipated.

**Project and Task Force Training**

Project and task force training is a special category of in-service training that is particularly appropriate for pre-commissioning training of staff not yet in place for new projects. Assessment for new projects must evaluate the employment pool and the capacity of relevant training institutions to provide the necessary training within the desired time frame. It is usual to distinguish between training for the construction phase and at a later stage, training for operational and maintenance work.

Task-force training is a form of project training in which the key staff to be involved in an aspect of the project receive training as a team before that aspect of the project begins. Task-force training strengthens interaction among the various team members. Management training is an important part of a successful task-force approach. The main problems encountered with task-force training are difficulties for the department in scheduling teams of staff to be available for training at the same time, and in devising new training methodologies based on team participation.

**Academic Training**

Academic training should be reserved for employees who demonstrate high quality and self-motivation in the performance of their duties that is those who concisely strain or exceed their established work targets. As the resources required for academic training are considerable, qualifying for and selection to academic training should be on a competitive basis. Academic training consists of specialized short courses, long term academic training that may or may not lead to an advance degree, and attending professional seminars and workshops.

**4.5. DETERMINE WHICH PERSONNEL TO TRAIN AND ON WHAT SUBJECT**

Different types of training are appropriate for various levels of managers or staff and for different performance problems. This can be visualized as a range of training with different degrees of priority:

**Priority 1.** Those activities, which should be strengthened as quickly as possible, for example, to prevent damage to canal structures, or to achieve a target irrigation schedule during a season. Normally this training takes the form of on-the-job or refresher training for personnel who already possess many of the required skills.

**Priority 2.** Performance shortcomings, which do not require immediate intervention, or those resulting from a shortage of qualified personnel, will probably involve specialist training at a location outside the department.

**Priority 3.** In every organization there are managers and other staff whose performance is not likely to improve as a result of training, and who are not eligible for specialist training. These people possibly may, however, be retrained to carry out different set of jobs.
5. TRAINING NEEDS SURVEY

5.1. DATA COLLECTION

Training Needs Survey was begun by surveying a range of informed sources and asked what training they think is required by a group of employees. This is basically a formal opinion survey, which is relatively quick but make no direct link to performance output at any level. A note was sent by Minister’s Office Director to all the MWRI units asking to provide information concerning the training priorities for their staff and to identify the selection criteria for the nominees. Training subjects are to meet future challenges in water resources management. A copy of the note sent is given in the following both in English and Arabic.

To: Chairman of ……………
From: Minister’s Office Director
Subject: Training Needs Assessment.
Date: February, 2009.

The MWRI is working with the US Agency for International Development in setting priorities with respect to academic training needs in the ministry and in identifying criteria for selection of the Ministry staff to be nominated for training. It is agreed that the nominee should be preferably (whether engineer or from other position disciplines) in young age and is promising to reach a leading position in the coming 15 years. Also it has been recommended that training subjects should be focused to meet future challenges in water resources management and to give the right attention to engineering, environmental, social, economical and institutional aspects of water resources. Among the training subjects are the following:

- Integrated water resources management
- Environmental engineering and water quality
- Climatic changes and effect on water resources
- Water communication
- Water extension
- Water economy
- Other fields of interest to the MWRI.

Academic Training will take place either in American University in Cairo or other Egyptian Academic Institutes wherever appropriate to obtain M.Sc degree. You are requested within one week to inform us about training needs of your department / sector and the names of staff recommended for training and their CVs giving the criteria for selection.

A meeting will be held that will be attended by other MWRI Departments/ Sectors Chairmen in order to prioritize the training needs within the available resources.
المهم، .........
تحية طيبة و بعد ... 

أحيط سعادتكم علما بأن الوزارة تبحث مع الوكالة الأمريكية الدولية وضع الأولويات بالنسبة للتدريب الأكاديمي الذي تحتاجه الوزارة مع تحديد المواصفات الواجب توافرها في المرشحين من التخصصات المختلفة لهذا التدريب بحيث يتم الترشيح من المهندسين و غيرهم من التخصصات من ضعف السن المجتهدين الذي يتوقع أن يكونوا على مستوى مرموق في الخمسة عشر عاما القادمة بما يؤهلهم لتولي المناصب القيادية في الوزارة.

ويراعى في اختيار موضوعات التدريب إن تتمشى مع متطلبات التغيير في دور الوزارة ومسئولياتها في المستقبل القريب و البعيد.

ومن المجالات المقترح التدريب عليها:
- الإدارة المتكاملة للموارد المائية واستخداماتها
- الهندسة البيئية و نوعية المياه
- التغير المناخي وأثره على الموارد المائية
- الإعلام المائي
- الاقتصادية المياه
- مجالات أخرى توليها الوزارة عنايتها الحالية و المستقبلية

سوف يتم التدريب إما في الجامعة الأمريكية بالقاهرة أو بالجامعات المصرية وذلك للحصول على درجة الماجستير.

يرجى موافاتنا خلال أسبوع من تاريخه باختياراتكم من هذا النوع من التدريب على النحو السابق إضافةً مع بيان المواصفات التي ترون ضرورة توافرها في المنسحبين وأسماء من يصلحون للترشيح والسيرة الذاتية الخاصة بهم.

وتفضلوا بقبول فائق الاحترام ...
5.2. ANALYSIS OF RESULTS

Table 5.1 presents the data provided by the different departments/sectors of the MWRI. It shows that the total number of the Ministry personnel nominated is 23 professional staff distributed as follows:

<table>
<thead>
<tr>
<th>Department/Authority</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Management Research Institute, NWRC</td>
<td>1</td>
</tr>
<tr>
<td>Irrigation Department Technical Office</td>
<td>1</td>
</tr>
<tr>
<td>Egyptian Public Authority for drainage projects</td>
<td>2</td>
</tr>
<tr>
<td>Minister’s Technical Office</td>
<td>1</td>
</tr>
<tr>
<td>Shore protection Authority</td>
<td>2</td>
</tr>
<tr>
<td>Planning Sector</td>
<td>2</td>
</tr>
<tr>
<td>Horizontal Expansion Sector</td>
<td>1</td>
</tr>
<tr>
<td>Groundwater Sector</td>
<td>1</td>
</tr>
<tr>
<td>Zagazig Integrated Water Resources and Irrigation District</td>
<td>2</td>
</tr>
<tr>
<td>Birket El Sabaa Integrated Water Resources &amp; Irrig. District</td>
<td>1</td>
</tr>
<tr>
<td>North Sinai Sector</td>
<td>2</td>
</tr>
<tr>
<td>Nile Protection Sector</td>
<td>1</td>
</tr>
<tr>
<td>Central Laboratory for Environmental Monitoring</td>
<td>1</td>
</tr>
<tr>
<td>Central Directorate for Canal Maintenance</td>
<td>1</td>
</tr>
<tr>
<td>General Directorate for Irrig. Improvement, Tanta</td>
<td>1</td>
</tr>
<tr>
<td>General Directorate for Water Distribution in Lower Egypt, Tanta</td>
<td>1</td>
</tr>
<tr>
<td>General Directorate for West Delta Drainage Projects</td>
<td>1</td>
</tr>
<tr>
<td>Salhiya General Directorate</td>
<td>1</td>
</tr>
</tbody>
</table>
Table 5-1 Selected Trainees, Qualifications and positions

<table>
<thead>
<tr>
<th>No.</th>
<th>Category</th>
<th>Names</th>
<th>Qualification</th>
<th>Grade</th>
<th>Age</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>I (Diploma)</td>
<td>Amira Galal Ahmed</td>
<td>Diploma Civil Eng. (2001)</td>
<td>Good</td>
<td>28</td>
<td>Planning Sector</td>
</tr>
<tr>
<td>2</td>
<td>I (Diploma)</td>
<td>Medhat Mahrous Abdalla</td>
<td>Diploma Civil Eng. (2006)</td>
<td>Good</td>
<td>32</td>
<td>Horizontal Expansion Sector</td>
</tr>
<tr>
<td>3</td>
<td>I (Diploma)</td>
<td>Mohamed Ibrahim El Hamrawy</td>
<td>Diploma Civil Eng. (2001)</td>
<td>Good</td>
<td>40</td>
<td>Salhiya General Directorate</td>
</tr>
<tr>
<td>6</td>
<td>II (Very Good)</td>
<td>Thoria Hassib Moahmed</td>
<td>B.Sc. Chemical Eng. (2001)</td>
<td>V.Good</td>
<td>30</td>
<td>Central Laboratory for Environmental Monitoring</td>
</tr>
<tr>
<td>9</td>
<td>II (Very Good)</td>
<td>Nabila Nassif Faragallah</td>
<td>B.Sc. Civil Eng. (1989)</td>
<td>V.Good</td>
<td>44</td>
<td>G. Directorate for Water Distribution in Lower Egypt-Tanta</td>
</tr>
<tr>
<td>10</td>
<td>II (Very Good)</td>
<td>Magdi Hassan Siam</td>
<td>B.Sc. Civil Eng. (1986)</td>
<td>V.Good</td>
<td>46</td>
<td>Shore-Protection Authority</td>
</tr>
<tr>
<td>11</td>
<td>III (Good)</td>
<td>Osama Mohamed Eweida</td>
<td>B.Sc. Civil Eng. (2002)</td>
<td>Good</td>
<td>29</td>
<td>Egyptian Public Authority for Drainage Projects</td>
</tr>
<tr>
<td>13</td>
<td>III (Good)</td>
<td>Yasser Aly Hussein</td>
<td>B.Sc. Civil Eng. (2001)</td>
<td>Good</td>
<td>31</td>
<td>Shore-Protection Authority</td>
</tr>
<tr>
<td>14</td>
<td>III (Good)</td>
<td>Iman Abdel Aziz Abdel Latif</td>
<td>B.Sc. Surveying (1999)</td>
<td>Good</td>
<td>33</td>
<td>Central Directorate for Canal Maintenance</td>
</tr>
<tr>
<td>15</td>
<td>III (Good)</td>
<td>Shereene Sayed Mahmoud</td>
<td>B.Sc. Civil Eng. (1998)</td>
<td>Good</td>
<td>34</td>
<td>Planning Sector</td>
</tr>
<tr>
<td>17</td>
<td>III (Good)</td>
<td>Safsa Khodary Osman</td>
<td>B.Sc. Communication Eng. (1993)</td>
<td>Good</td>
<td>38</td>
<td>Minister’s Technical Office</td>
</tr>
<tr>
<td>22</td>
<td>III (Good)</td>
<td>Yasser Abdel Kader Mohamed</td>
<td>B.Sc. Civil Eng. (1989)</td>
<td>Good</td>
<td>43</td>
<td>Nile Protection Sector</td>
</tr>
<tr>
<td>23</td>
<td>III (Good)</td>
<td>Safwat Mounir Mahdi</td>
<td>B.Sc. Civil Eng. (1986)</td>
<td>Good</td>
<td>46</td>
<td>North Sinai Sector</td>
</tr>
</tbody>
</table>

Among these 23 nominees, 13 show their desires to enroll at American University in Cairo, 3 already registered for M.Sc. degree in local universities. The nominees are divided in three categories: 3 in category 1 having diploma in civil engineering, 7 in category 2 having B.Sc. C.E. grade very good and 13 category 3 having B.Sc. C.E. grade good table 5.1. Results of the training needs assessment show that there are limited number of qualified candidates from the East Delta Region (where IWRM II Project is located), able to meet the AUC graduate admission standards. Many of the qualified candidates have indicated a preference to enroll in a part time program and not to take leave from the MWRI job to attend as full-time graduate students.

### 5.3. TRAINING SUBJECTS

A list of training subjects identified is given below and is classified according to their priorities in the survey:
- Integrated Water Resources Management and its applications
- Environmental Engineering and Water Quality
- Adapting to Climate Variability and Change
- Business Administration
- Construction Management
- Development and Protection of groundwater
- Participatory Irrigation Management
- Water Resources Development via recovery and Use of Wastewater in Agriculture
- Information Management
- Institutional Reform and Privatization

Table 5.2 shows the priority list of subjects distributed among different departments/sectors of the MWRI.

<table>
<thead>
<tr>
<th>Subject Selected</th>
<th>Number of Trainees</th>
<th>Degree</th>
<th>MWRI Department / Division</th>
<th>University</th>
<th>Qualifications</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Integrated Water Management Unit (IWMI)</td>
<td>Zagazig</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Egyptian Public Authority for Drainage Projects (EPADP)</td>
<td>Cairo</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Birket El Sabaa Water Resources And Irrigation District</td>
<td>AUC</td>
<td>B.Sc.C.E.(V.G.), Int. TOEFL score</td>
</tr>
<tr>
<td>Environmental Engineering and Water Quality</td>
<td>1</td>
<td>M.Sc.</td>
<td>Central Laboratory for Environmental Monitoring</td>
<td>Cairo</td>
<td>B.Sc. Chemical Engineering Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Irrigation Department, Technical Office</td>
<td>AUC</td>
<td>B.Sc.C.E.(G.), Int. TOEFL score (550)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Egyptian Public Authority for Drainage Projects (EPADP)</td>
<td>Cairo</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td>Adapting to Climate Variability and Change</td>
<td>1</td>
<td>M.Sc.</td>
<td>Shore Protection Authority</td>
<td>Zagazig</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Shore Protection Authority</td>
<td>AUC</td>
<td>B.Sc.C.E.(V.G.), Int. TOEFL score (550)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>North Sinai Sector</td>
<td>Suez Canal</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td>Participatory Irrigation Management</td>
<td>1</td>
<td>M.Sc.</td>
<td>Central Directorate for Irrigation Improvement</td>
<td>AUC</td>
<td>B.Sc.C.E.(V.G.), Int. TOEFL score (550)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Central Directorate for Canal Maintenance</td>
<td>Banha</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Central Directorate for Water Distribution in Lower Egypt</td>
<td>AUC</td>
<td>B.Sc.C.E.(V.G.), Int. TOEFL score (550)</td>
</tr>
<tr>
<td>Construction Management</td>
<td>1</td>
<td>M.Sc.</td>
<td>Horizontal Expansion Sector</td>
<td>AUC</td>
<td>B.Sc.C.E.(V.G.), Int. TOEFL score (550)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>Planning Sector</td>
<td>Cairo</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td>Institutional Reform and privatization</td>
<td>1</td>
<td>M.Sc.</td>
<td>Planning Sector</td>
<td>AUC</td>
<td>Diploma C.E., Int. TOEFL score (550)</td>
</tr>
<tr>
<td>Development and Protection of Groundwater Resources</td>
<td>1</td>
<td>M.Sc.</td>
<td>Ground Water Sector</td>
<td>AUC</td>
<td>B.Sc.C.E.(good), Int. TOEFL score (550)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.Sc.</td>
<td>North Sinai Sector</td>
<td>Suez Canal</td>
<td>B.Sc.C.E.(G.), Advanced Computer Skills, Language Proficiency</td>
</tr>
<tr>
<td>Information Management</td>
<td>1</td>
<td>M.Sc.</td>
<td>Minister’s Technical Office</td>
<td>AUC</td>
<td>B.Sc. Communication Engineering Advanced Computer Skills</td>
</tr>
<tr>
<td>Resource Administration</td>
<td>1</td>
<td>M.B.A</td>
<td>Ministry General Administration</td>
<td>AUC</td>
<td>Diploma C.E., Int. TOEFL score (550), score on GMAT Exam (550)</td>
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<td></td>
<td>1</td>
<td>M.B.A</td>
<td>Zagazig Integrated Water Management District</td>
<td>AUC</td>
<td>Diploma C.E., Int. TOEFL score (550), score on GMAT Exam (550)</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>M.B.A</td>
<td>North Sinai Sector</td>
<td>AUC</td>
<td>Diploma C.E., Int. TOEFL score (550), score on GMAT Exam (550)</td>
</tr>
</tbody>
</table>

Table 5.2 Training Needs Survey Output: Priority List

5.4. M.Sc. Candidate Criteria

Criteria reported by different MWRI Departments/Divisions includes:
- Educational attainment
- Years of experience
- Computer skills

38 MWRI TRAINING NEEDS ASSESSMENT
5.5. PROCEDURE FOR NOMINATING M.SC. CANDIDATES

As already stated in section 4.4 academic training should be reserved for employees who demonstrate high quality and self-motivation in their performance of their duties, that is, those who concisely strain or exceed their established work targets. As the resources required for academic training are considerable, qualifying for academic training should be on a competitive basis. Selection of training candidate should be based on written contribution or notable performance. Every candidate eligible to be nominated has to write an essay in Arabic or English on the recent developments related to his/her capability to undertake academic training in the designed subject. In the selection of the nominee, consideration is given to his/her technical competence, high character and integrity.

5.6. ENGLISH LANGUAGE PROGRAM FOR M.SC. TRAINING

The inability of candidates to meet the English language requirement set by USAID (score of 550 on TOEFL for academic training and 450 on TOEFL for technical training) was considerably stated as the major obstacle to their eligibility for American Institutions including American University in Cairo AUC. This need is not only great but also immediate as the training program will start by September 2009.

An intensive English language training has been provided for nominated candidates before they will start their M.Sc. program. America-Mideast Educational and Training Services Center (Amideast), as example, is providing English Language as well as GDAT courses. The MWRI training center is also providing English Language Program for the Ministry Staff.

Common Training Needs: An indicative list of categories of staff and examples of the main skills required by staff of MWRI at various hierarchical and broad occupational groupings is given in Annex B.
6. CONCLUSIONS

6.1. THE NEED FOR M.SC. TRAINING IN WATER RESOURCES MANAGEMENT

MWRI possesses considerable technical expertise; expertise that can be augmented by Egypt’s academic community. MWRI has received a considerable amount of training and technical assistance from various donors over past decades. The need for increased knowledge and improved skills that exist at the current time lies primarily in fields that either are new or have received little emphasis in the past. Examples include integrated water resources, stakeholder participation, privatization, information management, the process and approaches to policy making, policy analysis tools and how to communicate policies.

6.2. PURPOSE OF M.SC. TRAINING

Training should be carried within a broader framework that includes developing the management capacity within the Ministry departments. There is growing recognition that irrigation technology must also take into account environmental consideration and sociological characteristics such as farmers’ behaviour. Human resources development programs for MWRI should also include training in:

- Planning (including corporate and strategic planning, organization planning and financial planning).
- Integrated Water resources management.
- Participatory Irrigation Management
- Environmental Engineering and Water quality
- Public participation in Decision-making
- Information management
- Business Administration

6.3. OFFERING A VARIETY OF TYPES OF TRAINING

No one form of training will bring about the array of results under IWRM II. The TNA team recommends the capacity building of MWRI Personnel Task 2.4 offers various types of training, and that it be flexible in doing so. Seminars, workshops, and retreats are particularly well suited to senior executives. It would be wise to schedule such events early in the project to encourage openness to policy reform and enhance team building. Overseas observational trips and short courses also are suitable for district engineers and district managers, and a number of them made requests for such training.
6.4. CUSTOM-TAILORING COURSES

Short in-country skill development courses are well suited to senior managers and broad occupational groupings. Most of stakeholders interviewed expressed a preference for custom tailored courses. In some cases, on-the-job training and internships overseas also may be an appropriate form of training. All together, the training needs assessment team proposes 78 training courses for MWRI and its affiliated organizations. The various training courses can be grouped in 8 groups as shown in Annex B.

6.5. TRAINING NEEDS SURVEY

The analysis of the TNA survey and the interviews revealed a number of facts and problems, all having an impact on the M.Sc. training issues and needs of the staff:

- Capacity building, human resources development and training are critically important for the Ministry staff to cope with the ongoing as well as the anticipated policy and institutional reforms programs.

- MWRI responsibilities and role will be quite different in future and therefore capacity building requirements are different than in the past.

- An intensive capacity building program is required to prepare MWRI staff to function effectively as the Ministry’s role and responsibilities change in the future. Management leadership, social sciences and strategic planning training are required in addition to technical and research skills.

- Results of the training needs assessment shows that there are limited number of qualified candidates from the East Delta Region (where IWRM II is located), able to meet the AUC and local universities graduate admission standards. Research/Facilities/Program of studies of some American and Egyptian Universities are given in Annex C.

- Many of the qualified candidates have indicated a preference to enroll in a part time program and not to take leave from the MWRI to attend the full-time graduate students. This is being discussed with MWRI.

- The work plan for IWRM II Task 2.4 on Capacity Building of MWRI Personnel is given in Annex D showing objectives, approach and the activity schedule during the four years of the project (2009-2012).

- The IWRMII project signed an agreement with AUC to establish the Masters Degree scholarships program in Environmental Engineering at AUC (Annex E). Budget allows only 8 students to attend AUC, 6 of them are on full time basis.

- List of nominees for M.Sc. degree in American University in Cairo (Table 6.1) and other local universities (Table 6.2) are given below;
### Table 6-1 Names of candidates at American University in Cairo

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Department</th>
<th>Qualification</th>
<th>Position</th>
<th>Employment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Amira Galal</td>
<td>Environmental</td>
<td>C.E Diploma</td>
<td>Planning Sector</td>
<td>Permanent</td>
</tr>
<tr>
<td>2</td>
<td>Medhat Mahrous Abdalla</td>
<td>Environmental</td>
<td>C.E.Diploma</td>
<td>Horizontal Expansion Sector</td>
<td>Permanent</td>
</tr>
<tr>
<td>3</td>
<td>Said Riad Said</td>
<td>Environmental</td>
<td>B.Sc. (V.Good)</td>
<td>Water Management Research Institute</td>
<td>Permanent</td>
</tr>
<tr>
<td>4</td>
<td>Amr Mohamed Farid</td>
<td>Environmental</td>
<td>B.Sc. (V. Good)</td>
<td>Irrig.Dept.Tech.office</td>
<td>Permanent</td>
</tr>
<tr>
<td>5</td>
<td>Hossam Abdel Moneiam Taher</td>
<td>Environmental</td>
<td>B.Sc. (V. Good)</td>
<td>Berket El Sabaa Water Res.&amp; Irrig. District</td>
<td>Permanent</td>
</tr>
<tr>
<td>6</td>
<td>Nabil Nassif Faragala</td>
<td>Environmental</td>
<td>B.Sc. (V.Good)</td>
<td>G. Dir.for Water Distr.in lower Egypt</td>
<td>Permanent</td>
</tr>
<tr>
<td>7</td>
<td>Mohamed Ibrahim Elhamrawy</td>
<td>Business Adm.</td>
<td>C.E.Diploma</td>
<td>Salhiya Gen.Dir.</td>
<td>Permanent</td>
</tr>
<tr>
<td>8</td>
<td>Yasser Abdel Kadr Mohamed</td>
<td>Business Adm.</td>
<td>B.Sc. (Good)</td>
<td>Nile Protection Sector</td>
<td>Permanent</td>
</tr>
</tbody>
</table>

### Table 6-2 Names of candidates that will enroll in local universities

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>University</th>
<th>Qualification</th>
<th>Position</th>
<th>Employment Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Thoria Hassib Mohamed</td>
<td>Cairo</td>
<td>B.Sc. Chemical Eng.</td>
<td>Central Lab.for Env. Mcriptoing</td>
<td>Temporary</td>
</tr>
<tr>
<td>3</td>
<td>Magdi El-Shahat Hassan Siam</td>
<td>Zagazig</td>
<td>B.Sc. Civil Eng.</td>
<td>Shore protection Authority</td>
<td>Permanent</td>
</tr>
<tr>
<td>4</td>
<td>Osama Mohamed ElWeida</td>
<td>Cairo University</td>
<td>B.Sc. Civil Eng.</td>
<td>Egyptian Public Authority for drainage</td>
<td>Permanent</td>
</tr>
<tr>
<td>5</td>
<td>Heba Alaa ElDin Bishara</td>
<td>Alexandria</td>
<td>B.Sc. Civil Eng.</td>
<td>General Directorate for West Delta</td>
<td>Permanent</td>
</tr>
<tr>
<td>6</td>
<td>Iman Abdel Aziz AbdelLatif</td>
<td>Banha</td>
<td>B.Sc. Civil Eng.</td>
<td>Central Directorate for Canal Maintenance</td>
<td>Permanent</td>
</tr>
<tr>
<td>7</td>
<td>Shereen Saied Mohamed</td>
<td>Cairo</td>
<td>B.Sc. Civil Eng.</td>
<td>Planning Sector</td>
<td>Temporary</td>
</tr>
<tr>
<td>8</td>
<td>Amina Yehia Zaghoul</td>
<td>Cairo</td>
<td>B.Sc. Civil Eng.</td>
<td>Egyptian Public Auth.for Drainage Proj.</td>
<td>Permanent</td>
</tr>
<tr>
<td>9</td>
<td>Safaa Khodary Osman</td>
<td>AUC(alternate)</td>
<td>B.Sc. Civil Eng.</td>
<td>Minister's Technical office</td>
<td>Permanent</td>
</tr>
<tr>
<td>11</td>
<td>Emad El Din Fadl</td>
<td>AUC (alternate)</td>
<td>B.Sc. Civil Eng.</td>
<td>Ground Water Sector</td>
<td>Permanent</td>
</tr>
<tr>
<td>12</td>
<td>Anwar Amin Kassem</td>
<td>AUC (alternate)</td>
<td>B.Sc. Civil Eng.</td>
<td>Gen. Dir. For Irrig. Improvement</td>
<td>Permanent</td>
</tr>
<tr>
<td>14</td>
<td>Safwat Mounir Mahdi</td>
<td>Suez Canal</td>
<td>B.Sc. Civil Eng.</td>
<td>North Sinai Sector</td>
<td>Permanent</td>
</tr>
<tr>
<td>15</td>
<td>Yasser Aly Hussein</td>
<td>AUC (alternate)</td>
<td>B.Sc. Civil Eng.</td>
<td>Shore protection Authority</td>
<td>Permanent</td>
</tr>
</tbody>
</table>

- Overseas observational trips (study tours) and short courses are suitable for senior executives and professional staff. If planned well, implemented effectively, and followed up on, this kind of
training can be effective not only in exposing executives to new ideas, possibilities, and options for solving problems, but is in providing the inputs for them to institute those reforms that make sense in the Egyptian context.

- MWRI will need to continuously offer training opportunities to its bright young water resources managers and technical staff to assure that the next generation of senior decision makers are as well or better prepared as those currently in top positions. In some cases, training abroad will be advantageous.
7. REFERENCES


ANNEX A

Regional Center for Training and Water Studies: National Training Plan
2009 - 2010
<table>
<thead>
<tr>
<th>No.</th>
<th>Date From</th>
<th>Date To</th>
<th>Courses</th>
<th>Target Groups</th>
<th>Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>12/7/2009</td>
<td>16/7/2009</td>
<td>Soil Mechanics &amp; foundation Engineering</td>
<td>Civil Engineers</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>2</td>
<td>12/7/2009</td>
<td>16/7/2009</td>
<td>Training on management (development of personnel skills) level (1)*</td>
<td>Engineers / Graduates (1st / 2nd degree)</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>3</td>
<td>12/7/2009</td>
<td>16/7/2009</td>
<td>Development of (Administrative &amp; Financial Personnel Affairs) Skills by Using Computer *</td>
<td>Engineers / Graduates</td>
<td>• Background in computer &amp; Windows</td>
</tr>
<tr>
<td>4</td>
<td>12/7/2009</td>
<td>16/7/2009</td>
<td>Phonetics *</td>
<td>Engineers / Graduates</td>
<td>• Good background in English</td>
</tr>
<tr>
<td>5</td>
<td>12/7/2009</td>
<td>22/7/2009</td>
<td>ICDL Certificate *</td>
<td>Administratives</td>
<td>• Good background in English</td>
</tr>
<tr>
<td>6</td>
<td>15/7/2009</td>
<td>15/7/2009</td>
<td>The One Day Seminar</td>
<td>Engineers / Graduates</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>7</td>
<td>19/7/2009</td>
<td>30/7/2009</td>
<td>Operation &amp; Maintenance of Pumping Stations *</td>
<td>M &amp; E Technicians</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>8</td>
<td>19/7/2009</td>
<td>30/7/2009</td>
<td>Auto Cad Program level (1) *</td>
<td>Engineers / Technicians</td>
<td>• Background in computer &amp; Windows</td>
</tr>
<tr>
<td>9</td>
<td>19/7/2009</td>
<td>30/7/2009</td>
<td>English Course level (1) *</td>
<td>Engineers / Graduates</td>
<td>• Pass the pre-test</td>
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<tr>
<td>10</td>
<td>26/7/2009</td>
<td>30/7/2009</td>
<td>Collecting &amp; analysis of Soil Samples *</td>
<td>Technicians of the MWRI and its Institutions</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>11</td>
<td>26/7/2009</td>
<td>30/7/2009</td>
<td>Development of Skills in (Administrative Personnel Affairs &amp; Archives) *</td>
<td>Employees</td>
<td>• Working in the field of Administrative Affairs</td>
</tr>
<tr>
<td>12</td>
<td>26/7/2009</td>
<td>30/7/2009</td>
<td>Development of Communicational Skills *</td>
<td>Engineers / Graduates of Different Directorates and Districts of the MWRI and its Institutions</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>13</td>
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<td>30/7/2009</td>
<td>Canal Lining &amp; maintenance *</td>
<td>Civil Engineers of the MWRI and its Different Institutions</td>
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</tr>
<tr>
<td>14</td>
<td>29/7/2009</td>
<td>29/7/2009</td>
<td>The One Day Seminar</td>
<td>Engineers / Graduates</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>16</td>
<td>2/8/2009</td>
<td>6/8/2009</td>
<td>Power Point Program *</td>
<td>High/ Medium Qualifications</td>
<td>• Background in computer &amp; Windows</td>
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<tr>
<td>18</td>
<td>2/8/2009</td>
<td>6/8/2009</td>
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<td>Technicians</td>
<td>• Experience (not less Than 2 years in this field)</td>
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<td>20</td>
<td>2/8/2009</td>
<td>13/8/2009</td>
<td>Programmable Logic Controller (P.L.C.) level (1) *</td>
<td>M &amp; E Engineers</td>
<td>• Background in computer &amp; Windows and programming fundamentals</td>
</tr>
<tr>
<td>No.</td>
<td>Date From</td>
<td>Date To</td>
<td>Courses</td>
<td>Target Groups</td>
<td>Conditions</td>
</tr>
<tr>
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<td>21</td>
<td>9/8/2009</td>
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<td>Modern and Advanced Survey Equipment and its applications *</td>
<td>Technicians</td>
<td>• Experience (not less Than 2 years in this field)</td>
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<tr>
<td>22</td>
<td>9/8/2009</td>
<td>13/8/2009</td>
<td>Maintenance of Water Structures *</td>
<td>Engineers</td>
<td>• Experience (not less Than 2 years in this field)</td>
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<tr>
<td>24</td>
<td>9/8/2009</td>
<td>13/8/2009</td>
<td>Negotiations &amp; Resolving Conflicts *</td>
<td>Engineers / Graduates</td>
<td>• Experience (not less Than 5 years in this field)</td>
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<tr>
<td>25</td>
<td>9/8/2009</td>
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<td>Building Skills in Technical Monitoring Works *</td>
<td>Technicians</td>
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<tr>
<td>26</td>
<td>9/8/2009</td>
<td>13/8/2009</td>
<td>Training on Management (Developing Efficiency Skills of Employees) level (1)</td>
<td>Engineers / Graduates (1st / 2nd degree)</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>27</td>
<td>9/8/2009</td>
<td>20/8/2009</td>
<td>Auto Cad Program level (1) *</td>
<td>Engineers</td>
<td>• Background in computer &amp; Windows</td>
</tr>
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<td>28</td>
<td>9/8/2009</td>
<td>20/8/2009</td>
<td>English Course level (2) *</td>
<td>Engineers / Graduates</td>
<td>• Pass Level (1)</td>
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<tr>
<td>29</td>
<td>12/8/2009</td>
<td>12/8/2009</td>
<td>The One Day Seminar *</td>
<td>Enginers / Graduates</td>
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<td>30</td>
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<td>16/8/2009</td>
<td>20/8/2009</td>
<td>Periodical Maintenance of Irrigation &amp; Drainage Networks *</td>
<td>Engineers</td>
<td>• Working in the field of Irrigation &amp; Drainage</td>
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<td>32</td>
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<td>Developing Efficiency Skills for Storage Employees and Inventory Procedures *</td>
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<td>Training on Management (development of personnel skills) level (1) ♦</td>
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<td>35</td>
<td>19/8/2009</td>
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<td>A Seminar on the National Plan of Water Resources Management, the Mechanism of Implementation and the Institutional Reform ♦</td>
<td>Engineers / Graduates</td>
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<td>36</td>
<td>19/8/2009</td>
<td>19/8/2009</td>
<td>Analysis &amp; Evaluation of the 1st Quarter Courses of Training Programs for Year 2009 – 2010 and Recording the 1st Quarter Courses for year 2010 -2011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No.</td>
<td>Date From</td>
<td>Date To</td>
<td>Courses</td>
<td>Target Groups</td>
<td>Conditions</td>
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<td>---------</td>
<td>---------</td>
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</tr>
<tr>
<td>36</td>
<td>4/10/09</td>
<td>9/10/09</td>
<td>Laboratory Tests of water Quality*</td>
<td>Engineers</td>
<td>Experience (not less Than 3 years in this field)</td>
</tr>
<tr>
<td>37</td>
<td>4/10/09</td>
<td>9/10/09</td>
<td>Groundwater Management*</td>
<td>Engineers / Geologists</td>
<td>Experience (not less Than 2 years in Ground Water)</td>
</tr>
<tr>
<td>38</td>
<td>4/10/09</td>
<td>15/10/09</td>
<td>Sap 2000 programs (Advanced)</td>
<td>Civil Engineers</td>
<td>Pass Level (1)</td>
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<tr>
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<td>4/10/09</td>
<td>15/10/09</td>
<td>Sap 2000 program level (1)</td>
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<td>Background in computer &amp; Windows</td>
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<td>40</td>
<td>4/10/09</td>
<td>15/10/09</td>
<td>English Course Level (3)</td>
<td>Engineers / Graduates</td>
<td>Pass Level (2)</td>
</tr>
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<td>41</td>
<td>4/10/09</td>
<td>15/10/09</td>
<td>Designing Small Irrigation Structures</td>
<td>Civil Engineers</td>
<td>Working in the field of Irrigation and Drainage</td>
</tr>
<tr>
<td>42</td>
<td>11/10/09</td>
<td>15/10/09</td>
<td>Training on management (development of personnel skills) level (2)</td>
<td>Engineers / Graduates</td>
<td>Pass Level (1)</td>
</tr>
<tr>
<td>43</td>
<td>11/10/09</td>
<td>15/10/09</td>
<td>Agricultural Drainage Networks (Planning – Designing – Execution - Maintenance)*</td>
<td>Engineers</td>
<td>Experience (not less Than 2 years in this field)</td>
</tr>
<tr>
<td>44</td>
<td>11/10/09</td>
<td>15/10/09</td>
<td>Integrated Water Resources and Irrigation Management</td>
<td>Engineers (1st / 2nd degree)</td>
<td>Experience (not less Than 5 years in this field)</td>
</tr>
<tr>
<td>45</td>
<td>11/10/09</td>
<td>15/10/09</td>
<td>Technical Training for Promoting Assistant Director of Works</td>
<td>Civil Engineers</td>
<td>No Experience Required</td>
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<tr>
<td>46</td>
<td>18/10/09</td>
<td>18/10/09</td>
<td>Soil Mechanics &amp; foundation Engineering of Irrigation Structures</td>
<td>Civil Engineers</td>
<td>Experience (not less Than 3 years in this field)</td>
</tr>
<tr>
<td>47</td>
<td>18/10/09</td>
<td>18/10/09</td>
<td>Management of Water Requirements Using Mathematical Models*</td>
<td>Civil Engineers of the MWRI different Institutions</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>48</td>
<td>18/10/09</td>
<td>18/10/09</td>
<td>Economic Visibility Studies of Irrigation &amp; Drainage Projects</td>
<td>Engineers (Districts' Engineers are preferable)</td>
<td>Experience (not less Than 5 years)</td>
</tr>
<tr>
<td>49</td>
<td>18/10/09</td>
<td>18/10/09</td>
<td>Procurements, Preparation of contracts and Inventory Procedures*</td>
<td>Engineers / Graduates</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>50</td>
<td>18/10/09</td>
<td>18/10/09</td>
<td>English Course Level (1)</td>
<td>Engineers / Graduates</td>
<td>Pass the Pretest</td>
</tr>
<tr>
<td>51</td>
<td>18/10/09</td>
<td>20/10/09</td>
<td>ICDL Certificate</td>
<td>Graduates / Graduates</td>
<td>Good background in English</td>
</tr>
<tr>
<td>52</td>
<td>25/10/09</td>
<td>29/10/09</td>
<td>Technical Training for Promoting Director of Works</td>
<td>Civil Engineers</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>53</td>
<td>25/10/09</td>
<td>29/10/09</td>
<td>Technical Specifications &amp; Quality Control of Water Structures Concrete</td>
<td>Civil Engineers</td>
<td>Experience (not less Than 2 years in this field)</td>
</tr>
<tr>
<td>54</td>
<td>25/10/09</td>
<td>29/10/09</td>
<td>Introduction to Computer (Windows &amp; Word)</td>
<td>High /Medium Qualifications</td>
<td>No Experience Required</td>
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<tr>
<td>55</td>
<td>28/10/09</td>
<td>29/10/09</td>
<td>The One Day Seminar</td>
<td>Engineers / Graduates</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>No.</td>
<td>Date From</td>
<td>Date To</td>
<td>Courses</td>
<td>Target Groups</td>
<td>Conditions</td>
</tr>
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<tr>
<td>56</td>
<td>1/11/09</td>
<td>5/11/09</td>
<td>Micro Soft Excel*</td>
<td>Engineers / Graduates</td>
<td>• Background in computer &amp; Windows</td>
</tr>
<tr>
<td>57</td>
<td>1/11/09</td>
<td>5/11/09</td>
<td>Using Telemetry System in Control &amp; Water Distribution *</td>
<td>Engineers</td>
<td>• Working in Irrigation and Drainage</td>
</tr>
<tr>
<td>58</td>
<td>1/11/09</td>
<td>5/11/09</td>
<td>Water Users’ Participation in Irrigation Systems Management ♦</td>
<td>Technicians</td>
<td>• Working in the field of Irrigation &amp; Irrigation Advisory Services</td>
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<tr>
<td>59</td>
<td>1/11/09</td>
<td>5/11/09</td>
<td>Codes &amp; Standards of Specifications of Concrete *</td>
<td>Civil Engineers</td>
<td>• Experience (not less Than 3 years) in Structures</td>
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<tr>
<td>60</td>
<td>1/11/09</td>
<td>5/11/09</td>
<td>Integrated Management of Projects (Planning- Follow-up- Monitoring- Evaluation)</td>
<td>Engineers of the MWRI different Institutions</td>
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<tr>
<td>61</td>
<td>1/11/09</td>
<td>12/11/09</td>
<td>Auto Cad Programs (Advanced) *</td>
<td>Technicians</td>
<td>• Pass Level (1)</td>
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<tr>
<td>62</td>
<td>1/11/09</td>
<td>12/11/09</td>
<td>Geographical Information System GIS *</td>
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<tr>
<td>63</td>
<td>4/11/09</td>
<td>4/11/09</td>
<td>The One Day Seminar*</td>
<td>Engineers / Graduates</td>
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<td>64</td>
<td>8/11/09</td>
<td>12/11/09</td>
<td>Power Point Programs *</td>
<td>Engineers / Graduates</td>
<td>• Background in computer &amp; Windows</td>
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<tr>
<td>65</td>
<td>8/11/09</td>
<td>12/11/09</td>
<td>Modern On Farm Irrigation Systems *</td>
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<td>• Experience (not less Than 3 years in this field)</td>
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<td>66</td>
<td>8/11/09</td>
<td>12/11/09</td>
<td>Technical Preparation for Inspectors *</td>
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<td>• No Experience Required</td>
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<td>67</td>
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<td>19/11/09</td>
<td>English Course Level (2) *</td>
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<td>19/11/09</td>
<td>Auto Cad Programs ■</td>
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<td>• Background in computer &amp; Windows</td>
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<td>69</td>
<td>15/11/09</td>
<td>19/11/09</td>
<td>Introduction to Computer (Windows &amp; Word) *</td>
<td>High / Medium Qualifications</td>
<td>• No Experience Required</td>
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<td>70</td>
<td>15/11/09</td>
<td>19/11/09</td>
<td>Canal Pollution &amp; Ways of Treatment *</td>
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<td>71</td>
<td>15/11/09</td>
<td>19/11/09</td>
<td>Measuring Discharge in Open Channels &amp; Pipes *</td>
<td>Technicians</td>
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<td>72</td>
<td>15/11/09</td>
<td>19/11/09</td>
<td>Gender and Women Role in Water Management *</td>
<td>Engineers (Junior Staff)</td>
<td>• No Experience Required</td>
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<td>73</td>
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<td>19/11/09</td>
<td>Development of Skills in Administrative Personnel Affairs &amp; Archives *</td>
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<td>19/11/09</td>
<td>Training on management (development of personnel skills) level (2) ■</td>
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<td>• Pass Level (1)</td>
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<tr>
<td>75</td>
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<td>10/12/09</td>
<td>Codes &amp; Standards of Specifications of Concrete ♦</td>
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<tr>
<td>No.</td>
<td>Date</td>
<td>Courses</td>
<td>Target Groups</td>
<td>Conditions</td>
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<td>76</td>
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<td>Maintenance of Administrative Structures *</td>
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<td>Experience (not less than 2 years in this field)</td>
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<td>77</td>
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<td>Testing Structure Materials &amp; Quality Control *</td>
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<td>78</td>
<td>6/12/09</td>
<td>Micro Soft Excel *</td>
<td>High/Medium Qualifications</td>
<td>Background in computer &amp; Windows</td>
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<tr>
<td>79</td>
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<td>Web Design *</td>
<td>Engineers / Graduates</td>
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<td>80</td>
<td>6/12/09</td>
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<td>13/12/09</td>
<td>Technical Training for Promoting Director of Works *</td>
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<tr>
<td>82</td>
<td>18/12/09</td>
<td>A Seminar on &quot;the MWRI Organizational Structure and the Development of Its Activities *</td>
<td>Engineers / Graduates (Junior Staff)</td>
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<td>83</td>
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<td>84</td>
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<td>Access Program ➤</td>
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<td>85</td>
<td>20/12/09</td>
<td>Desert Sands’ Movement &amp; Ways of Protection *</td>
<td>Engineers of the MWRI different Institutions</td>
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<tr>
<td>86</td>
<td>31/12/09</td>
<td>(ICDL) Certificate *</td>
<td>Engineers / Graduates</td>
<td>Good Background in English</td>
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</tr>
<tr>
<td>87</td>
<td>27/12/09</td>
<td>Planning &amp; Designing Shore Protection Works *</td>
<td>Engineers</td>
<td>Working in Irrigation &amp; Shore Protection</td>
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<tr>
<td>88</td>
<td>27/12/09</td>
<td>Development of (Personnel Affairs) Skills</td>
<td>Engineers / Graduates of the MWRI different Institutions</td>
<td>No Experience Required</td>
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<tr>
<td>89</td>
<td>27/12/09</td>
<td>Computer Maintenance (A + Soft Ware) *</td>
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<td>Background in computer &amp; Windows</td>
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<tr>
<td>90</td>
<td>29/12/09</td>
<td>The One Day Seminar *</td>
<td>Engineers / Graduates</td>
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<tr>
<td>3/1/2010</td>
<td>7/1/2010</td>
<td>Analysis &amp; Evaluation of the 2nd Quarter Courses of Training Programs for Year 2009 – 2010 and Recording the 2nd Quarter Courses for year 2010 -2011</td>
<td>Training Center *</td>
<td>Kafr El-Sheikh ▪ Esna ▪ Minya ◊ South Valley ➤ Tanta ◊ Nubaria ▪</td>
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<tr>
<td>No.</td>
<td>Date From</td>
<td>Date To</td>
<td>Courses</td>
<td>Target Groups</td>
<td>Conditions</td>
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<tr>
<td>91</td>
<td>10/1/2010</td>
<td>14/1/2010</td>
<td>Modern Approaches in Financial &amp; Administrative Affairs *</td>
<td>Engineers / Graduates</td>
<td>No Experience Required</td>
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<tr>
<td>92</td>
<td>10/1/2010</td>
<td>14/1/2010</td>
<td>Technical Preparation for Inspectors *</td>
<td>Civil Engineers</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>93</td>
<td>10/1/2010</td>
<td>14/1/2010</td>
<td>Resist &amp; Management of Water Weeds *</td>
<td>Engineers</td>
<td>Working in the field of Irrigation, Drainage &amp; Nile Protection</td>
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<tr>
<td>94</td>
<td>10/1/2010</td>
<td>14/1/2010</td>
<td>Information Systems &amp; Support Decision Making *</td>
<td>Engineers (1st &amp; 2nd degrees)</td>
<td>Good background in English &amp; Computer</td>
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<tr>
<td>95</td>
<td>10/1/2010</td>
<td>21/1/2010</td>
<td>English Course Level (1) *</td>
<td>Engineers / Graduates</td>
<td>Pass the Pre-test</td>
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<tr>
<td>96</td>
<td>10/1/2010</td>
<td>21/1/2010</td>
<td>English Course Level (2) ▶</td>
<td>Engineers / Graduates</td>
<td>Pass Level (1)</td>
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<tr>
<td>97</td>
<td>10/1/2010</td>
<td>21/1/2010</td>
<td>English Course Level (1) •</td>
<td>Engineers / Graduates</td>
<td>Pass the Pre-test</td>
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<tr>
<td>98</td>
<td>10/1/2010</td>
<td>21/1/2010</td>
<td>(ICDL) Certificate *</td>
<td>Graduates &amp; Medium Qualifications</td>
<td>Good Background in English</td>
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<tr>
<td>99</td>
<td>17/1/2010</td>
<td>21/1/2010</td>
<td>Untraditional Water Resources &amp; Its Best Use *</td>
<td>Engineers</td>
<td>Working in the field of Irrigation &amp; Drainage</td>
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<tr>
<td>100</td>
<td>17/1/2010</td>
<td>21/1/2010</td>
<td>Maintenance &amp; Repair of Pumping Stations ◆</td>
<td>Technicians</td>
<td>Working in the field of Mechanics &amp; Electricity</td>
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<td>101</td>
<td>17/1/2010</td>
<td>21/1/2010</td>
<td>Excel Programs ◆</td>
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<tr>
<td>102</td>
<td>17/1/2010</td>
<td>28/1/2010</td>
<td>Programmable Logic Controller (P.L.C.) level (2) *</td>
<td>M &amp; E Engineers</td>
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<tr>
<td>104</td>
<td>24/1/2010</td>
<td>28/1/2010</td>
<td>Integrated water Resources Management *</td>
<td>Engineers</td>
<td>Experience (not less Than 5 years in this field)</td>
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<tr>
<td>105</td>
<td>24/1/2010</td>
<td>4/2/2010</td>
<td>Using (GPS) equipment in Surveys &amp; Hydrographical Works *</td>
<td>Engineers / Graduates</td>
<td>Background in computer &amp; Windows</td>
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<tr>
<td>106</td>
<td>27/1/2010</td>
<td>28/1/2010</td>
<td>The One Day Seminar *</td>
<td>Engineers / Graduates</td>
<td>Background in computer &amp; Windows</td>
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<tr>
<td>107</td>
<td>31/1/2010</td>
<td>4/2/2010</td>
<td>Training on Management (development of personnel skills) level (3) *</td>
<td>Engineers / Graduates</td>
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<tr>
<td>108</td>
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<td>11/2/2010</td>
<td>Primavera Programs *</td>
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<td>110</td>
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<td>111</td>
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<td>11/2/2010</td>
<td>Agricultural Drainage (Planning- Designing- Execution- Operation)*</td>
<td>Engineers</td>
<td>Experience (not less Than 5 years in this field)</td>
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</tbody>
</table>

Training Center * Kafr El-Sheikh • Esna • Minya • South Valley ▶ Tanta @ Nubaria
<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Courses</th>
<th>Target Groups</th>
<th>Conditions</th>
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<tbody>
<tr>
<td>112</td>
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<td>Auto Cad Programs►</td>
<td>Engineers / Graduates</td>
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<tr>
<td>113</td>
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<td>Development of Skills in Financial Affairs*</td>
<td>Employees</td>
<td>• Working in the field of Financial Affairs</td>
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<tr>
<td>114</td>
<td>08/2/2010</td>
<td>English Course level (1) ■</td>
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<td>• Pass the pre-test</td>
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<tr>
<td>115</td>
<td>11/2/2010</td>
<td>The One Day Seminar►</td>
<td>Engineers / Graduates</td>
<td>• No Experience Required</td>
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<tr>
<td>116</td>
<td>18/2/2010</td>
<td>Groundwater Protection Against Pollution *</td>
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<td>• Working in the field of Ground Water</td>
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<td>117</td>
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<td>Water Quality Management</td>
<td>Engineers</td>
<td>• Working in the field of Irrigation &amp; Drainage</td>
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<tr>
<td>118</td>
<td>18/2/2010</td>
<td>Technical Training for Promoting Assistant Director of Works *</td>
<td>Civil Engineers</td>
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<tr>
<td>119</td>
<td>08/2/2010</td>
<td>Rain Harvesting and Use♦</td>
<td>Engineers of the MWRI Different Institutions</td>
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<tr>
<td>120</td>
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<td>121</td>
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<td>Engineers</td>
<td>• Pass the Pre-test</td>
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<tr>
<td>122</td>
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<td>• No Experience Required</td>
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<tr>
<td>123</td>
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<td>• Experience (not less Than 2 years in this field)</td>
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<td>124</td>
<td>25/2/2010</td>
<td>Calculating Quantities &amp; Preparing Specifications of Irrigation and Drainage Projects *</td>
<td>Civil Engineers</td>
<td>• Experience (not less Than 3 years in this field)</td>
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<tr>
<td>125</td>
<td>4/3/2010</td>
<td>English Course Level (3) *</td>
<td>Engineers / Graduates</td>
<td>• Pass Level (2)</td>
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<tr>
<td>126</td>
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<td>Planning &amp; Designing Shore Protection Works *</td>
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<td>127</td>
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<td>Employees</td>
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<td>Phonetics ■</td>
<td>Engineers / Graduates</td>
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### National Training Plan
#### 2009/2010
#### 3rd Quarter
#### From 10/1/2010 to 25/3/2010

<table>
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<th>Target Groups</th>
<th>Conditions</th>
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<tr>
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<td>18/3/2010</td>
<td>Remote Sensing Technology*</td>
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<td>Background in computer &amp; Windows</td>
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<tr>
<td>139</td>
<td>14/3/2010</td>
<td>18/3/2010</td>
<td>Water Users' Participation in Water Resources Management *</td>
<td>Engineers of the MWRI different Institutions</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>140</td>
<td>18/3/2010</td>
<td>19/3/2010</td>
<td>The One Day Seminar *</td>
<td>Engineers / Graduates</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>141</td>
<td>21/3/2010</td>
<td>25/3/2010</td>
<td>Photo Shop Program •</td>
<td>Engineers / Graduates (Junior Staff)</td>
<td>Background in computer &amp; Windows</td>
</tr>
<tr>
<td>142</td>
<td>21/3/2010</td>
<td>25/3/2010</td>
<td>Technical Training for Promoting Director of Works *</td>
<td>Civil Engineers</td>
<td>No Experience Required</td>
</tr>
<tr>
<td>No.</td>
<td>Date From</td>
<td>Date To</td>
<td>Courses</td>
<td>Target Groups</td>
<td>Conditions</td>
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<tr>
<td>144</td>
<td>11/4/2010</td>
<td>15/4/2010</td>
<td>Training on Management (development of personnel skills) level (4) ■</td>
<td>Engineers / Graduates</td>
<td>• Pass Level (3)</td>
</tr>
<tr>
<td>146</td>
<td>11/4/2010</td>
<td>15/4/2010</td>
<td>Nile Basin Hydrology *</td>
<td>Civil Engineers</td>
<td>• Experience (not less than 5 years in the field of Irrigation)</td>
</tr>
<tr>
<td>150</td>
<td>11/4/2010</td>
<td>22/4/2010</td>
<td>English Course Level (1) *</td>
<td>Engineers / Graduates</td>
<td>• Pass the Pre-test</td>
</tr>
<tr>
<td>152</td>
<td>18/4/2010</td>
<td>22/4/2010</td>
<td>Using Integrated Surveying Stations in Execution Works *</td>
<td>Engineers</td>
<td>• Experience (not less than 3 years in this field)</td>
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<tr>
<td>154</td>
<td>18/4/2010</td>
<td>22/4/2010</td>
<td>Training on Management (development of personnel skills) level (4) ■</td>
<td>Engineers / Graduates</td>
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<tr>
<td>155</td>
<td>18/4/2010</td>
<td>22/4/2010</td>
<td>Water Resources Laws &amp; Legislations *</td>
<td>Engineers / Graduates</td>
<td>• Experience (not less than 5 years in this field)</td>
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<tr>
<td>156</td>
<td>18/4/2010</td>
<td>29/4/2010</td>
<td>Primavera Programs*</td>
<td>Civil Engineers</td>
<td>• Background in computer &amp; Windows and English</td>
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<tr>
<td>157</td>
<td>18/4/2010</td>
<td>29/4/2010</td>
<td>Sap 2000 Program Level (1)*</td>
<td>Civil Engineers</td>
<td>• Background in computer &amp; Windows</td>
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<tr>
<td>158</td>
<td>28/4/2010</td>
<td>20/4/2010</td>
<td>The One Day Seminar</td>
<td>Engineers / Graduates</td>
<td>• No Experience Required</td>
</tr>
<tr>
<td>159</td>
<td>2/5/2010</td>
<td>6/5/2010</td>
<td>Integrated Water Resources Management *</td>
<td>Engineers</td>
<td>• Experience (not less than 5 years in this field)</td>
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<tr>
<td>162</td>
<td>2/5/2010</td>
<td>6/5/2010</td>
<td>Technical Training for Promoting Director of Works *</td>
<td>M &amp; E Engineers</td>
<td>• No Experience Required</td>
</tr>
</tbody>
</table>

Training Center *: Kafr El-Sheikh ● Esna ■ Minya ♦ South Valley ► Tanta @ Nubaria
<table>
<thead>
<tr>
<th>No.</th>
<th>Date From</th>
<th>Date To</th>
<th>Courses</th>
<th>Target Groups</th>
<th>Conditions</th>
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<tbody>
<tr>
<td>163</td>
<td>2/5/2010</td>
<td>6/5/2010</td>
<td>Training on Management (development of personnel skills) level (4) *</td>
<td>Engineers</td>
<td>• Pass Level (3)</td>
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<tr>
<td>164</td>
<td>2/5/2010</td>
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<td>English Course Level (2) *</td>
<td>Engineers / Graduates</td>
<td>• Pass Level (1)</td>
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<tr>
<td>165</td>
<td>2/5/2010</td>
<td>13/5/2010</td>
<td>SW Engineering *</td>
<td>Engineers / Graduates</td>
<td>• Background in computer &amp; Windows</td>
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<tr>
<td>166</td>
<td>2/5/2010</td>
<td>13/5/2010</td>
<td>English Course Level (1) ■</td>
<td>Medium Qualifications</td>
<td>• Pass the Pre-test</td>
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<tr>
<td>167</td>
<td>2/5/2010</td>
<td>27/5/2010</td>
<td>On Farm Irrigation Management *</td>
<td>Civil Engineers, Agri. Engineers &amp; Geologists</td>
<td>• No Experience Required</td>
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<tr>
<td>168</td>
<td>9/5/2010</td>
<td>13/5/2010</td>
<td>Planning &amp; Follow-up of Investment Plan *</td>
<td>Engineers</td>
<td>• Experience (not less Than 3 years in this field)</td>
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<tr>
<td>171</td>
<td>9/5/2010</td>
<td>13/5/2010</td>
<td>Photo Shop Program ►</td>
<td>Engineers / Graduates</td>
<td>• Background in computer &amp; Windows</td>
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<tr>
<td>172</td>
<td>16/5/2010</td>
<td>20/5/2010</td>
<td>Climatic Change Impacts on Water Resources *</td>
<td>Engineers of the MWRI and its Different Institutions</td>
<td>• No Experience Required</td>
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<tr>
<td>173</td>
<td>16/5/2010</td>
<td>3/6/2010</td>
<td>Pre TOEFL *</td>
<td>Engineers / Graduates</td>
<td>• Pass Pre TOEFL</td>
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<tr>
<td>174</td>
<td>23/5/2010</td>
<td>27/5/2010</td>
<td>Technical Preparation for Inspectors *</td>
<td>Civil Engineers</td>
<td>• No Experience Required</td>
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<tr>
<td>175</td>
<td>26/5/2010</td>
<td>27/5/2010</td>
<td>The One Day Seminar *</td>
<td>Engineers</td>
<td>• No Experience Required</td>
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<tr>
<td>176</td>
<td>30/5/2010</td>
<td>3/6/2010</td>
<td>Quality Control Of Water Structures *</td>
<td>Civil Engineers</td>
<td>• Experience (not less Than 3 years in this field)</td>
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<tr>
<td>177</td>
<td>30/5/2010</td>
<td>10/6/2010</td>
<td>Programmable Logic Controller (P.L.C.) (Advanced)*</td>
<td>M &amp; E Engineers</td>
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<td>178</td>
<td>30/5/2010</td>
<td>10/6/2010</td>
<td>3D Max Studio Program *</td>
<td>Engineers</td>
<td>• Background in computer &amp; Windows</td>
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<tr>
<td>179</td>
<td>30/5/2010</td>
<td>10/6/2010</td>
<td>Primavera Program ►</td>
<td>Engineers</td>
<td>• Background in computer &amp; Windows</td>
</tr>
<tr>
<td>180</td>
<td>6/6/2010</td>
<td>10/6/2010</td>
<td>Technical Specifications &amp; Quality Control of Water Structures’ Concrete</td>
<td>Civil Engineers</td>
<td>• Experience (not less Than 3 years in this field)</td>
</tr>
<tr>
<td>181</td>
<td>6/6/2010</td>
<td>10/6/2010</td>
<td>Water Resources Laws &amp; Legislations*</td>
<td>Engineers / Graduates</td>
<td>• Experience (not less Than 3 years in this field)</td>
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</table>
### National Training Plan

#### 2009/2010

#### 4th Quarter

From 11/4/2010 to 25/6/2010

<table>
<thead>
<tr>
<th>No.</th>
<th>Date From</th>
<th>Date To</th>
<th>Courses</th>
<th>Target Groups</th>
<th>Conditions</th>
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<tbody>
<tr>
<td>182</td>
<td>6/6/2010</td>
<td>10/6/2010</td>
<td>Computer Maintenance (A + Soft Ware) *</td>
<td>Engineers / Graduates</td>
<td>• Background in computer &amp; Windows</td>
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<td>183</td>
<td>13/6/2010</td>
<td>17/6/2010</td>
<td>Water Crisis Management *</td>
<td>Engineers</td>
<td>• Experience (not less Than 3 years in this field)</td>
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<tr>
<td>184</td>
<td>13/6/2010</td>
<td>24/6/2010</td>
<td>English Course Level (3) ■</td>
<td>Engineers / Graduates</td>
<td>• Pass Level (2)</td>
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<td>185</td>
<td>16/6/2010</td>
<td>16/6/2010</td>
<td>The One Day Seminar *</td>
<td>Engineers</td>
<td>• No Experience Required</td>
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<tr>
<td></td>
<td>20/6/2010</td>
<td>24/6/2010</td>
<td>Analysis &amp; Evaluation of the 4th Quarter Courses of Training Programs for Year 2009 – 2010 and Recording the 4th Quarter Courses for year 2010 -2011</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Training Center * Kafr El-Sheikh • Esna ■ Minya ♦ South Valley ▶ Tanta @ Nubaria •

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56 MWRI TRAINING NEEDS ASSESSMENT
ANNEX B

Common Training Needs:
An Indicative List of Categories of Staff and Their Requirements
Common Training Needs Identified

Examples of the main skills required by staff of MWRI at various hierarchical and broad occupational groupings include the following:

1. **Senior Managers (Level 1, General Directors and Senior Researchers)**
   - Corporate Planning.
   - Strategic Planning.
   - Leadership Skills.
   - Organization Planning.
   - Management of Change.
   - Communication.
   - Negotiations with other Agencies.
   - Staff Motivation.
   - Presentations to Boards and Ministers.
   - Media and Public Relations.
   - Language and Computer Skills.

2. **Middle Managers (Level 2 and Researchers)**
   - Communication.
   - Motivating Staff.
   - Industrial Relations Negotiations.
   - Personnel Management.
   - Leadership.
   - Supervising Staff.
   - Decision-making.
   - Report Writing and Presentation.
   - Controlling Budgets.
   - Contract Administration.
   - Identifying information Needs.
   - Information Management.
   - Preparing Budget Estimates.
   - Occupational Health and Safety.
   - Language and Computer Skills.

3. **Supervisors (Level 3 and Researcher Assistant)**
   - Job Descriptions.
   - Supervising Staff.
   - Motivating Staff.
   - Site Supervision.
   - Performance Appraisal.
   - Leadership.
   - Communication.
   - Instructing Staff in New Roles.
   - Resolving Conflict.
   - Occupational Health and Safety.
   - Language and Computer Skills.
4. Professional Technical (Junior Engineers)
   - Cost Estimating.
   - Report Writing and Presentation.
   - Integrated Water Resources Management.
   - Project Networking (scheduling).
   - Site Supervision.
   - Design of Irrigation and Drainage System.
   - Irrigation Scheduling.
   - Preparing Budget Estimates.
   - Analyzing Social, Economical, Environmental and Technical Information.
   - Project Documentation.
   - Identifying Information Needs.
   - Developing Efficient Operating System.
   - Language and computer skills.

5. Professional Commercial and Business
   - Financial Planning.
   - Preparing budget estimates.
   - Auditing expenditure.
   - Basic accounting.
   - Report writing and presentation.
   - Maintaining information systems.
   - Identifying information needs.
   - Current cost accounting.
   - Instructing staff in new roles.
   - Language and computer skills.

6. Administration/clerical
   - Handling Repetitive Workloads.
   - Preparing Position Descriptions.
   - Communications.
   - Clerical and Administrative Skills.

7. Technicians
   - Using New Equipment.
   - Communication.
   - Motivating Staff.
   - Handling New Materials.
   - Site Supervision.
   - Instructing Staff in New Roles.
   - Leadership.
   - Mobile and Fixed Plant-Operations and Maintenance.
   - Occupational Health and Safety.

8. Operators
   - Irrigation and Drainage Systems Operational Maintenance.
   - Multi-Skill Capabilities.
   - Handling Repetitive Workload.
   - Mobile and Fixed Plant-Operation.
ANNEX C

Research / Facilities / Program of Studies of American University in Cairo and some Egyptian Universities
American University in Cairo
Master of Science in Environmental Engineering

The Master of Science in Environmental Engineering is an interdisciplinary engineering program administered by a director and steering committee from the engineering departments. It provides a broad program of study in preparation for careers in advanced engineering areas as well as in-depth knowledge in environmental engineering with a strong research components. Graduate will be prepared for PhD studies or for research and leadership positions in government, industry and international consulting companies.

The objectives of the program are to provide the graduate with:

- A broad knowledge of modern computational and experimental methods in engineering.
- Extensive knowledge in fundamental environmental engineering science; the interactions of pollutants in water, air and subsurface environments; and the design of treatment and pollutant remediation systems.
- In-depth understanding of the research methods and data analysis in one of the areas of environmental engineering noted above.
- An ability to solve unstructured engineering problems, think critically, function well in a team and communicate effectively.
- A high standard of written and oral communication on technical matters.

Admission Requirements
A candidate for the Master of Science program must have a degree in engineering. Students who have some deficiency in their undergraduate training but are well-qualified in other respects may be admitted provisionally.

The program director may prescribe a program of noncredit work to make up for the deficiency.

Program Requirements
A minimum of eight courses (24 credit hours) is required. The courses are selected from the following categories:

Core courses (six credit hours)
All students select two out of the following four ENGR core courses:
- ENGR 511 Computational Methods in Engineering
- ENGR 512 Experimental Methods in Engineering
- ENGR 516 Engineering for a Sustainable Environment
- ENGR 518 Engineering Statistics

Concentration courses (12)
Students should select a of engineering courses:
- ENVE 561 Water Quality Control
- ENVE 562 Unit Operations in Environmental Engineering
- ENVE 564 Air Pollution Control Engineering
- ENVE 567 Environmental Chemistry
- ENVE 569 Ground Water Hydrology and Contamination
Elective courses (six credit hours)
A minimum of two courses are selected as electives from a set of graduate courses in engineering, physical sciences, social sciences, management and other related graduate level courses subject to adviser and director approval. No more than one 400-level course in engineering, computer science and other related areas, not in the student's undergraduate major, may be taken for graduate credit subject to adviser and director approval.

Thesis
Graduate thesis work is an important and required part of the environmental engineering Master of Science program. Each student must submit a thesis topic that has been approved by a faculty adviser by the end of the first academic year. Various research topics are discussed in ENGR 590 and 591, Graduate Thesis Seminar I and II. Students must register in ENGR 590 before submitting a thesis topic and in ENGR 591 during execution of the thesis research to present their thesis plan. To ensure adequate faculty consultation on the thesis, the student must register for ENVE 599 Graduate Thesis before the completion of 18 credit hours. Students must register in ENVE 599 continuously and for at least two semesters. The first two registrations in ENVE 599 must be for three credit hours, after that it is taken for one credit hour each semester until completion of the program requirements.

Contact
Environmental Engineering Program
Tel.: 20.2.2797.5329
e-mail enve@aucegypt.edu
www.aucegypt.edu/academics/gradstudies

Business Administration (M.B.A.)

The MBA is a professional degree designed to prepare students who have completed undergraduate work in any academic discipline and intend to pursue a management career. The curriculum emphasizes the principles underlying business operations as well as advanced technical knowledge in relevant specializations. It provides tools for analysis and helps develop a managerial perspective. Advanced specialized and elective courses provide the necessary skills in a functional area of business.

Admission
All applicants must satisfy the university’s graduate admission requirements. Admission to the MBA program is competitive and limited. Criteria for admission include GMAT score, English proficiency, years of relevant management experience and undergraduate GPA. An interview may be required.

To obtain the MBA degree, a minimum of 33 semester credit hours and a maximum of 48 credit hours are required. The exact number of credits will be determined according to the educational background of each candidate.

MBA Foundation Courses (3-27 credits)

The MBA Foundation courses are directed at providing the student with a basic background in the various functional areas of management. Between one and nine courses are required for the completion of the foundation courses. These courses are usually chosen from the following list:
ACCT 501 - Financial Reporting (3 cr.)
FINC 527 - Managerial Economics (3 cr.)
FINC 540 - Financial Management (3 cr.)
MGMT 501 - Business Communication and Negotiation (3 cr.)
MGMT 502 - Managing Organizations (3 cr.)
MKTG 520 - Marketing Management in a Global Economy (3 cr.)
MOIS 508 - Management Information System (3 cr.)
OPMG 507 - Quantitative Analysis for Management (3 cr.)
OPMG 520 - Operations Management for Competitive Advantage (3 cr.)

MBA Electives and Concentration (18-27 credits)

Advanced coursework for the MBA constitutes a diversified program aiming at providing the student with:
General background in the concepts, processes, and institutions of finance, marketing, personnel, and operations management.
Decision-making tools and techniques such as accounting, quantitative methods, and management information systems.
Organizational theory, economic analysis, and business policy and strategy.

Students must take a minimum of 9 credit hours that covers at least three of the following business areas:
- Accounting
- Finance
- International Business
- Leadership and Human Resources Management
- Management of Information Systems
- Marketing
- Operations Management

Students may concentrate in one of these areas by taking at least three courses in that area

(9 credit hours).

Accounting

ACCT 502 - Cost Analysis and Control (3 cr.)
ACCT 503 - Financial Analysis, Planning and Valuation (3 cr.)
ACCT 504 - Budgeting and Financial Planning (3 cr.)
ACCT 505 - International Accounting (3 cr.)
ACCT 570 - Selected Topics in Accounting and Auditing (3 cr.)
ACCT 575 - Independent Study in Accounting (1-3 cr.)

Finance

FINC 541 - Advanced Topics in Finance and Investment (3 cr.)
FINC 542 - International Financial Management (3 cr.)
FINC 543 - Financial Markets (3 cr.)
FINC 544 - Advanced Corporate Finance (3 cr.)
FINC 545 - Private Equity and Venture Capital (3 cr.)
FINC 546 - Financial Analysis, Planning and Valuation (3 cr.)
FINC 570 - Selected Topics in Financial Management (3 cr.)
FINC 575 - Independent Study in Financial Management (1-3 cr.)

International Business

ACCT 505 - International Accounting (3 cr.)
FINC 542 - International Financial Management (3 cr.)
MGMT 506 - Management of International Business Operations (3 cr.)
MGMT 507 - Global Business Strategy (3 cr.)
MGMT 575 - Independent Study in Management (1-3 cr.)
MKTG 524 - International Marketing (3 cr.)
Leadership and Human Resources Management

MGMT 503 - Organizational Development (3 cr.)
MGMT 504 - Human Resources Strategy (3 cr.)
MGMT 509 - Leadership (3 cr.)
MGMT 570 - Selected Topics in Management (3 cr.)
MGMT 575 - Independent Study in Management (1-3 cr.)

Management of Information Systems

MOIS 517 - Technology and Innovation Management (3 cr.)
MOIS 549 - Business Systems (3 cr.)
MOIS 550 - Information Technology (3 cr.)
MOIS 551 - Electronic Business (3 cr.)
MOIS 555 - Information Strategy (3 cr.)
MOIS 570 - Selected Topics in Management of Information Systems (3 cr.)
MOIS 575 - Independent Study in Management of Information Systems (1-3 cr.)

Marketing

MKTG 521 - Marketing Research (3 cr.)
MKTG 522 - Marketing Channels and Distribution Management (3 cr.)
MKTG 523 - Sales Management (3 cr.)
MKTG 524 - International Marketing (3 cr.)
MKTG 525 - Marketing Strategy (3 cr.)
MKTG 526 - Marketing Communications Management (3 cr.)
MKTG 570 - Selected Topics in Marketing (3 cr.)
MKTG 575 - Independent Study in Marketing (1-3 cr.)

Operations Management

OPMG 521 - Supply Chain and Logistics (3 cr.)
OPMG 528 - Project Management (3 cr.)
OPMG 530 - Data Analysis (3 cr.)
OPMG 531 - Stochastic Models in Managerial Decision Making (3 cr.)
OPMG 532 - Operations Strategy (3 cr.)
OPMG 533 - Business Dynamics (3 cr.)
OPMG 570 - Selected Topics in Operations Management (3 cr.)
OPMG 575 - Independent Study in Operations Management (1-3 cr.)
MBA Capstone Course (3 credits)

Finally, a capstone course, the following is required for all MBA candidates:
MGMT 508 - Strategic Business Management (3 cr.)
Ain Shams University
Ain Shams University - Faculty of Engineering
M.Sc. Degree in Engineering

Ain Shams University awards, upon the recommendation of the Faculty council, the M.Sc. degree in the following fields:

- M.Sc. in Civil Engineering
- M.Sc. in Architectural Engineering
- M.Sc. in Electrical Engineering
- M.Sc. in Mechanical Engineering
- M.Sc. in Engineering Physics & Mathematics.

Applicants for enrollment to an M.Sc. Study and research program in the first four fields should pass a B.Sc. degree in the field of specialization with a grade of “Good” at least from a Faculty of engineering of one of the Egyptian universities or another recognized institutes. It is possible to accept students awarded Postgraduate Diploma in Engineering with a general grade of “Good”. In addition, applicants for M.Sc. in the Engineering Physics & Mathematics should successfully completed the special preliminary studies stipulated in the Faculty statute. Prospective applicants should have been awarded the B.Sc. degree one year at least before enrollment. Demonstrators, assistants and the similar are exempted from this condition. M. Sc. students are intended to attend two days at least full time per week and should therefore obtain the permission of their job authorities. Fulfillment of the M.Sc. degree in Engineering necessitates the study of a set of courses totally equivalent to twenty four (24 hours) divided equally on two academic semesters. The regulation determines the requirements of the department to certain courses, which are equivalent to twelve (12) hours, and the rest of the required courses are selected based on the research plan. In addition to the courses, the student has to carry out a scientific research, submitting eventually a thesis containing the results of the research and passing an oral examination.
Cairo University
Cairo University - Faculty of Engineering
Irrigation and Hydraulics

Historical Review

The great Egyptian civilization was closely tied to the Nile River throughout its long history. An everlasting task for the Egyptians has been to enhance its performance to maximize the benefit out of its water. This gave rise to an astonishingly flourishing development of sciences related to hydraulics, irrigation, hydrology, groundwater along the banks of the Nile since the early history.

The first school for irrigation engineering in Egypt in recent times was established at Kanater in 1858. The school was then transferred to Cairo in 1867 to form a joint institute together with the school of architecture. In 1886, a new institute under the name of the Irrigation Department was established with five year study program before graduation. The institute then moved to Giza in 1902.

The old Hydraulics Laboratory was established in 1923 under the supervision of a group of eminent British engineers. The Civil Engineering Department of Cairo University was established in 1926 and included six divisions; Irrigation, Sanitary, Bridges, Harbors, Surveying and Railways. In 1956, the Civil Engineering Department was divided, study-wise, into three major Departments; Structural Engineering, Irrigation & Hydraulics and Public Works.

Main Programs

The Department of Irrigation and Hydraulics is responsible for the following programs:

- Fluid Mechanics
- Hydraulics
- Irrigation and Drainage
- Hydrology and Water Resources
- Harbor and Coastal Engineering.
- Irrigation and Hydraulic Engineering Department (1994)

The program offers three Master of Science and Doctorate of Philosophy Degrees diplomas. The three diplomas are in the following areas:

- Irrigation and Drainage Engineering
- Water Resources Engineering
- Coastal and Harbor Engineering.

Over the past 15 years, the Department of Irrigation and Hydraulics has granted more than 90 M.Sc. degrees and 20 Ph.D. degrees.

The Irrigation and Hydraulics Laboratory

The Irrigation and Hydraulics Laboratory occupies the ground floor of the Irrigation and Hydraulics department of Cairo University. The laboratory has a well designed and unique U shape layout with three connected sections with total area of some 2400 squares meters. This space combined with two balconies overlooking the main floor qualify the laboratory to be the largest educational laboratory in Egypt.

Since 1994 ongoing efforts are being devoted to the renovation, replacement, and enhancement of the existing infrastructure and equipment. The laboratory is expected to meet the following goals:
• To provide a sound environment for performing undergraduate laboratory experiments and training in the fields of fluid mechanics, hydraulics, irrigation, environmental and hydrological studies

• To provide well equipped facilities required for post graduate research with particular emphasis on topics related to the River Nile, irrigation systems, conjunctive use of Egyptian water resources, open channel and closed conduit flows, water quality monitoring and analysis, and also the environmental impacts of industrial processes.

• To help enhance consulting services provided to outside customers-- private and public, national and regional -- through performing physical and mathematical modeling for existing and proposed hydraulic structures, sediment estimation, flood routing, pipe networks, ... etc. In addition to the routine work associated with pump tests, the laboratory conducts calibration tests for pipes, valves, measuring devices, sprinklers ... etc.

Achievements

Staff members of the Department of Irrigation and Hydraulics have carried out a multitude of research studies and engineering works. Some have participated in steering and/or evaluation committees for variety of projects. The following list shows several examples of studies and projects conducted over the past fifteen years:

• Hydrological studies for the water balance of the Upper Nile Catchments.
• Forecasting of the inflow to Lake Nasser and developing operation rules for the High Dam of Aswan.
• Cost allocation models for irrigation water in Upper and Middle Egypt.
• Design methodology for the Egyptian canals after the construction of the Aswan High Dam.
• Development of the River Nile navigational capacity.
• Preliminary studies for the estimation and utilization of the sediments in Lake Nasser.
• Studies for Essna Barrage and seismic analysis for the High Aswan Dam.
• Groundwater studies for the North African aquifer, East of Oinat mountain aquifer, Nile Delta aquifer, Nile Valley aquifer ... etc.
• Study of the effect of groundwater table in Cairo and Giza on ancient Egyptian monuments.
• Protection of several cities and villages in Upper and Middle Egypt against flash floods.
• Protection of the 15th of May and Shorouqe cities against floods.
• Protection of the Railway section between the cities of Qena and Abu-Tartour against floods and sand waves.
• Evaporation and salinity studies of the proposed Qattara Depression Project.
• Feasibility study of solar ponds in Egypt.
• Design of tile drainage systems in areas subject to artesian conditions in the Nile Delta.
• Modeling water and salt movement in the soil profile related to irrigation and drainage practices within an overall agricultural hydrology frame work.
• Design of a large number of groundwater wells utilized in desert reclamation.
• Design of several drip irrigation schemes.
• Study of the gains and losses from the several reaches of the River Nile in Egypt.
• Rehabilitation of several channels and associate irrigation and navigation works.
ANNEX D

Work Plan for IWRM II
Task 2.4 “Capacity Building of MWRI Personnel”
Task 2.4 Capacity Building of MWRI Personnel

Objectives
Assist MWRI in providing graduate level training opportunities for its employees to increase productivity, efficiency, equitable allocation, and improved water quality of water resources.

Background
Funds have been obligated to IWRM II by USAID to provide long-term Masters Degree training for up to 50 staff of MWRI in American University in Cairo and other Egyptian academic institutions focusing on staff that will be assigned to management positions in the East Delta region.

Expected Results
Improved practices for recruitment, training, and retention of qualified staff.

Expected Outputs (Deliverables)
- Training Needs Assessment Report
- List of universities and candidates
- Orientation seminar
- Progress and evaluation reports
- Final Report.

Partners
The key partners for this task will be IWMU, MWRI Minister’s office, the American University in Cairo, and other Egyptian academic institutions.

Approach
IWRM II will assist MWRI to improve its practices for recruitment, training, and retention of qualified staff, and will sponsor local MS degree training for qualified staff based on identified MWRI priorities. Several lessons were learned in the course of implementing the IWRM I graduate degree training program that will inform the IWRM II approach. In particular, trainees where possible, require paid leave from their MWRI positions to enable them to pursue their academic programs on a full-time basis and complete their degree requirements before the end of a project. Under IWRM I, some attended universities on a part-time basis, and did not complete their programs by the close of the project. In addition, candidates for graduate degree study should be required to commit to return to MWRI upon completion of their academic programs.

The IWRM II Team will work with MWRI and with USAID/Egypt to determine how thinking about graduate training priorities has evolved since presentation of the Ministry’s training needs assessment in June 2003, and what the respective roles of the Ministry, Mission, and IWRM II should be in planning for the new in-country MS degree program. IWRM II will take a central role in all phases of the process including conducting an updated training needs assessment, designing and overseeing procedures for the selection of trainees, and providing input into the selection of training institutions to match Ministry needs with programs offered. IWRM II will also assist training candidates with application processes, provide pre-program orientation, and monitor trainee progress. IWRM II will design and maintain follow-up programs to help keep returned trainees up to date in their fields and in contact with professional colleagues. The training needs assessment (TNA) will be completed within the first 6 months of the project to allow time for the trainees to apply and be accepted to start their graduate work in the fall of 2009. The TNA, carried out with support and participation of MWRI, will follow procedures used during the 2003 assessment. The TNA will focus on long-term Masters Degree training for up to 50 MWRI staff, focusing on staff that will be assigned to management positions in the East Delta region. It will include an organizational analysis to identify overall MWRI needs and capabilities, development of appropriate criteria for program and trainee selection, and collection of information on academic institutions, curriculum, and potential...
trainees. IWRM II will investigate programs such as Zagazig University’s “E-learning” system in Water and Environmental Studies. The TNA report will present the findings.

IWRM II will work with MWRI to select trainees on a competitive basis, to ensure trainees commit to stay with MWRI after completion of their training, and to identify appropriate local institutions and programs for graduate level training for the selected individuals. At least 10 percent of the approved training (50 percent of the allocated funds) will be conducted at the American University of Cairo. IWRM II will work with MWRI and the American University to prepare a program that both meets the needs of MWRI and fits within the university’s academic structure.

A flow chart showing the activity schedule, draft indicators, and targets for the LOP is shown below.
## 2.4 Capacity Building of MWRI Personnel

### 2.4.1 Assess the needs for Masters degree training:
1. 50 qualified MWRI staff
2. Focus on E Delta staff

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<tr>
<th>Activities</th>
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<tbody>
<tr>
<td>1. Determine MWRI Training Priorities</td>
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<td>MWRI Priorities for Graduate Degree Training</td>
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<td>1. Review Training Needs Assessment</td>
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<td>2. Meet Senior MWRI Personnel</td>
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<tr>
<td>2. Design Procedure for Selection of Trainees</td>
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<td>50 Candidates Selected</td>
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<tr>
<td>2.1 Screening Candidates for Academic Training</td>
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<td>2.2 Organize Selection Panel</td>
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<td>2.3 Selection of Candidates</td>
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### 2.4.2 Identify local institutions and programs for graduate level training:
1. selected individuals
2. 50% of approved budget for training at AUC

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<tr>
<td>3. Selection of Training Institutes in Egypt</td>
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<td>Institution selected per prospective trainees</td>
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<td>4. Assist Trainees with Application Process</td>
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### 2.4.3 Administer approved training programs including payment of fees

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<tr>
<td>1. Assist Trainees</td>
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<td>1.2 Orientation for Candidates</td>
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<td>2. Monitor Progress of Trainees</td>
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<td>2.2 Trainees in local Universities</td>
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ANNEX E

Agreement Between IRG & AUC
Agreement

The following are the terms of the agreement between the International Resources Group (hereinafter referred to as IRG) and the American University in Cairo (hereinafter referred to as AUC) to establish The M.S. Scholarships Program in Environmental and Water Resources Engineering and Management at AUC.

I. Introduction

The M.S. Scholarships in Environmental and Water Resources Engineering and Management is jointly offered by IRG and The American University in Cairo (AUC) and funded by the United States Agency for International Development (USAID) as Integrated Water Resources Management Project 2 (IWRM-2). The program's primary objective is to build human infrastructure in the form of development of leadership in environmental and water resources engineering for Egypt, particularly in the critical areas of water quality and water resources development. The program will enable qualified Egyptian engineering college graduates to attend a reputable M.S. program at AUC on a full tuition-free scholarship basis. A full project description is given in the proposal entitled “M.S. Scholarships in Environmental and Water Resources Engineering and Management,” dated May 2009, and attached hereto as “Attachment A.” The highlights of this proposal are summarized below.

II. Who Should Apply

Eligible applicants for the M.S. in Environmental Engineering (M.S. ENVE) are those who have received their bachelor degrees in an engineering discipline from an accredited university. Applicants are expected to have scored top marks at the bachelor level (minimum GPA of 3.0 out of 4.0) or passed the Graduate Record Examination (GRE) or TOEFL exam. Applicant’s work experience and any post-B.S. educational experience are considered in evaluating applicants who do not meet the minimum GPA requirement. Candidates who meet all criteria and are admitted into the program but require additional English language training will be enrolled in AUC’s English Language Institute program to strengthen their language skills to ensure success in the program, and funding will be provided from an auxiliary budget to this agreement as needed. Up to two students may apply for the Masters in Business Administration (MBA) at AUC under this agreement. Applicants to this program do not have to be from engineering, but must achieve an acceptable score on the GMAT in addition to the other requirements noted above.

III. Student Recruiting

The pool of eligible applicants will be identified by IRG in consultation with the Ministry of Water Resources and Irrigation. Applicants to the program must meet AUC’s requirements for admission and for appointment as a Graduate Research Fellow as administered by the AUC Graduate admission office and the Environmental Engineering Program Director, and, in the case of MBA applicants, the AUC Management Department.
IV. Program Design and Administration

The program will admit 8 students beginning in academic year 2009/2010. The program will terminate the end of calendar year 2011; i.e., 31 December 2011. Students are expected to complete the academic program in two years. The M.S.-ENVE program is 33 semester credit hours and includes a thesis. If the thesis has not been completed within a 24 month period, any continuation expenses will be the responsibility of the student in this case. The MBA program is up to 48 semester credit hours, but should also be completed in two years for a full-time student. The MBA program does not require a thesis, and students can take up to four courses per semester in addition to summer courses if needed. In either case, students not finishing the degree within the project dates specified herein will be responsible for paying the Graduation Fee.

An annual review to discuss the progress of the project and address any concerns that arise in the course of execution will be conducted by the Director of the Environmental Engineering program at AUC and IRG representatives. AUC shall notify IRG of any material aspects in relation to a student’s failure to maintain the necessary academic standing for participation in this fellowship program. AUC will also notify IRG of any recommendation to discontinue Scholarship support to a specific student.

V. Program Costs

This is a fixed cost agreement at a total project cost of LE 1,414,642. See Attachment B "Budget" for details. The funds will be paid to AUC in four installments:

- LE 57,790 on 1 June 2009 — this amount represents 10% of the Year 1 payment
- LE 519,298 on 1 September 2009 — the remaining 90% of the Year 1 payment
- LE 681,057 on 1 September 2010
- LE 156,887 on 1 September 2011.

VI. Project Duration

The duration of the project is thirty one months beginning 1 June 2009 and ending 31 December 2011.

VII. Intellectual Property

Title to any intellectual property (IP) (e.g., invention) conceived and reduced to practice in the performance of research by a student funded through this agreement and his/her faculty advisor, whether patentable or not, shall be owned 100 percent by AUC. AUC alone will have the right to license the IP and will own 100 percent of any royalties derived therein.

Copyright to any written works for publication deriving from research by a student funded through this agreement and his/her faculty advisor shall vest in the authors. In such event, the support of IRG will be acknowledged in the published work as follows: “This research was sponsored in part by a graduate research fellowship award to (initials of student) by International Resources Group.”
VIII. Use of Names

Neither party may use the name of the other for publicity purposes without the written approval of the other.

IX. Independent Contractor

The parties hereto intend to act as independent contractors, and neither is an employee, partner, joint venturer or agent of the other. Neither party may enter into any agreement on behalf of the other.

X. Amendments, Changes, and Waivers

This Agreement is the entire and complete agreement of the parties, and supersedes any prior agreements, offers, discussions or representations. This Agreement may not be amended or changed, and none of its provisions may be waived, except through an amendment in writing signed by authorized representatives of the parties.

All disputes shall be resolved amicably by negotiations. In the event that any disputes are not resolved amicably, all unresolved disputes arising out of or in connection with this Agreement shall be finally settled under the Rules of Arbitration of the Egyptian Law.

For IRG

Name: Dr. Jeffrey W. Fredricks
Title:
Signature:

For AUC

Name: Dr. Lisa Anderson
Title: Provost
Signature:

International Resources Group
LIFE
Integrated Water Resources Management Project
2.4 Information flyers or brochure on capacity building opportunities for MWRI staff by IWRM II