ARAB REPUBLIC OF EGYPT

MINISTRY OF WATER RESOURCES AND IRRIGATION (MWRI)

PLANNING SECTOR

ENHANCED WATER RESOURCES MANAGEMENT PROJECT (EWRMP)

ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)

January 2012

Table Contents

ACRONYMS

BCWUA	Branch Canal Water Users Associations
CDIAS	Central Directorate for Irrigation Advisory Service
DWB	District Water Board
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EALIP	Executive Authority for Land Improvement Project
EHS	Environmental Health Standards
EPADP	Egypt's Public Authority for Drainage Projects
ESMF	Environmental and Social Management Framework
EWRMP	Enhanced Water Resources Management Project
FAO	Food and Agricultural Organization
FIMP	Farm-level Irrigation Modernization Project
GDP	Gross Domestic Product
GoE	Government of Egypt
GEF	Global Environment Facility
GIS	Geographic Information System
HAD	High Aswan Dam
IFAD	International Fund for Agriculture Development
IFC	International Finance Corporation
IIIMP	Integrated Irrigation Improvement and Management Project
IIP	Irrigation Improvement Project
ISSIP	Integrated Sanitation and Sewerage Infrastructure Project
IWRM	Integrated Water Resource Management
IWMD	Integrated Water Management District
MALR	Ministry of Agriculture and Land Reclamation
MES	Monitoring and Evaluation System
M&E	Monitoring and Evaluation
MWRI	Ministry of Water Resources and Irrigation
NDP2	Second National Drainage Project
NRI	Nile Research Institute
NWRC	National Water Resources Council
PCU	Project Coordination Unit
PDO	Project Development Objective
PMU	Project Management Unit

PS	Planning Sector
RIGW	Research Institute of Groundwater
RPF	Resettlement Policy Framework
SADBP	Sustainable Agricultural Development Business Plan
SADS	Sustainable Agricultural Development Strategy
SWM	Solid Waste Management
TA	Technical Assistance
TOR	Term of Reference
WB	World Bank
WUA	Water User Association
WWTP	Waste Water Treatment Project\

1. Executive Summary

Sector background and project Objectives

Egypt depends almost entirely on 55.5 billion m3 per year of water from the Nile River. This allocation represents 95 percent of the available resource for the country. Demand for water is growing rapidly, fuelled by rise of living standards, industrial development, and agricultural expansion. Whereas the options for increasing supply are limited. To respond, the Ministry of Water Resources and Irrigation (MWRI) has been implementing an Integrated Water Resource Management (IWRM) Plan since 1997. Its key strategy is to promote and apply the IWRM principles. Managing irrigation & drainage and their water quality is a key element of this plan.

As part of MWRI's continued efforts to improve the water quality and surface and groundwater management, the MWRI prepared the Enhanced WRM Project (EWRMP, or the Project), including this "Environmental and Social Management Framework" (ESMF). The Project Development Objectives (PDOs) are to pilot IWRM in the Nile Delta and to enhance the knowledge and capacity of water sector institutions for IWRM in Egypt. Specifically, the project will promote the IWRM principles and practices through: (i) awareness-raising, institutional and capacity strengthening, and demonstration activities implemented in the selected pilot schemes (3 pilots) in the Nile Delta to improve the coordination among water project management units (PMUs for 3 ongoing projects), Government agencies, local authorities and water user associations (WUAs); and (ii) technical assistance (TA) on targeted studies, capacity building, training, and provision of equipment to strengthen the capacity and knowledge of the national institutions in water sector and to improve the national water resources monitoring networks.

Project incremental activities pose no significant negative impacts

The incremental activities financed by the GEF Project will mostly be of the low-cost soft-type (TA, training, operating costs), with few goods (US$0.4m in Okda pilot area). Thus these activities do not have significant negative impacts. Whereas, any associated impacts resulting from IIIMP, ISSIP or NDPII will be adequately dealt with by their existing ongoing EMPs and Resettlement Policy Framework (RPF). one incremental hard-type/physical interventions by IIIMP or NDP2 will be guided and mobilized (but not financed) by the Project. An example is the planned intervention in El-Khadraweya pilot, as the Project will study the options (e.g. in-stream wetland vs. off-stream treatment) and select the best option (in Component 1). Civil works of the latter will be financed by NDPII and not by the Project. At the time of preparing NDPII, its EMP did not envisage that NDPII could invest in a physical solution in El-Khadraweya. Hence the ESMF of EWRMP Project will support NDPII-EMU to ensure safe disposal of the solid/liquid pollutants that will be captured by the selected solution. Any hazardous/non-hazardous wastes will be disposed per the WB/IFC "Environmental Health Standards" (EHS). Collected wastes are to be sampled, analyzed, and

all pollutants exceeding the ambient water standards should be disposed at least 300 meters from waterways, farmer lands and wildlife habitats, or dumped in properly-located landfills.

As for the social safeguards, no negative impacts were envisaged at Project appraisal/negotiation. Subject to the detailed design stage and Site-specific EAs (after the Project starts), in the unlikely case that a negative impact may occur in a given site (e.g. temporary loss of private incomes), the mechanisms indicated in the RPF for IIIMP, ISSIP, and NDP2 will be implemented. In June and August 2011 MWRI held stakeholder consultations for the 3 Project pilot areas; and the stakeholders feedback was positive about the Project interventions as well as about its ESMF.

This document is deemed an ESM "Framework", because Site-specific EA/EMPs will be undertaken under Component 1 for each of the 3 pilots, which will help determine, *inter alia*, the best set of SWM interventions. These (pilot) Site-specific EA/EMPs will be conducted as per the WB operational policies and guidelines (including consultations and disclosure). A Draft Table of Contents of the TOR for these Site-specific EAs/EMPs is provided in Annex 3.

The SWM activities totaling US$1.6m are not deemed part of the total ESMF budget ($0.75m) because SWM is more of a core Project activity leading to its Project Development Objective (PDO indicator #3: "WUAs trained on IWRM including water pollution control"), rather than a mitigation of Project impact.

The Project's GEF-financed incremental SWM activities (in Component 1) are mostly of the soft-type, such as TA and training (in all 3 pilots), apart from small equipment ($400,000 only in Okda/Teleen pilot). Whereas, the hard-type/physical SWM interventions will be financed by IIIMP and NDP2 in Nekla and Khadraweya pilots respectively (TBD based on the Site-specific EAs; e.g. BCWUA tractors or landfill works in Nekla). The SWM-related activities for Khadraweya pilot will all be of the soft-type, GEF-financed (TA, training, monitoring, for safe disposal of the liquid and solid wastes that will be captured by the to-be-selected physical intervention on the drain). Land for landfills will be a public land or donated by the local elites. Hence, safeguards wise, the Project is categorized "B".

The waste collected will be disposed in duly authorized and regulated landfills and in compliance with the Egyptian law and WB guidelines (see Annex 2). The purpose of these SWM activities is not processing or recycling the collected waste. The purpose (to fulfill the PDO) is to safely take away the wastes from the irrigation and drainage canals supported by IIIMP and NDP2, so they can function as designed. However, if during Project implementation, based on the findings of the Site-specific EA, the Project finds that WUAs are interested in composting, reusing or selling processed waste (and that these "byproducts" essentially encourage them to keep the canals/drains clean), the Project would in this case elevate its engagement in SWM by supporting the WUAs to implement waste processing and recycling/marketing in the 3 pilots. In this case, there would be higher risks warranting different levels of prevention/mitigation/monitoring (currently not addressed in Project Appraisal Document); hence, in this case, the Project would be restructured, and safeguards Category raised from B to A.

Project Environmental and Social Management Framework (ESMF)

The ESMF will comprise: **(1) Monitor** impacts on ambient water quality and public health in areas adjacent to the 3 pilots including areas close to the Northern Lakes (under Component 2, through NWRC coordinating with NDP2 and IIIMP M&E Units); and **(2) Empower** MWRI's Planning Sector (PS) and the EMU of NDPII to address the water-quality aspects of IWRM, including SWM (in Component 1) and any riparian aspects (based on the results of Lake Nasser evaporation study under Component 2).

ESMF Organizational Set-up and Budget

The coordinator of the PCU at the Planning Sector (PS) of MWRI will work as a part-time Environmental Specialist, to follow up the ESMF in cooperation with NWRC and the EMUs of IIIMP, NDP2 and ISSIP. The EMU of NDPII will be the *defacto* EMU for GEF-EWMP only as regards the two drainage-related pilots in Component 1: Khadraweya and Oqda/Teleen. Implementing the ESMF is budgeted at US$0.75m (including contingencies). This budget will be financed (mainly from GEF) under the Project Components as follows:

- Component 1 (3 Pilots): finances the ESMF TA consultancies and goods/equipment;
- Component 2 (led by NWRC): ESMF monitoring activities will be undertaken under the Project-wide M&E activities.
- Component 3 (PCU): Finances most of the ESMF incremental operating costs (field visits, water quality sampling, training, etc).

2. Introduction

Strategic context

Egypt depends almost entirely on 55.5 billion m3 per year of water from the Nile River. This allocation represents 95 percent of the available resource for the country. Demand for water is growing rapidly, fuelled by rise of living standards, industrial development, and agricultural expansion. Whereas the options for increasing supply are limited. To respond, the Ministry of Water Resources and Irrigation (MWRI) has been implementing an Integrated Water Resource Management (IWRM) Plan since 1997. Its key strategy is to promote and apply the IWRM principles. Managing irrigation is the key element of this plan. Approximately 85 percent of the Nile water is used for irrigated agriculture. Agriculture is a key sector of the Egyptian economy, providing livelihoods for about 55 percent of the population and directly employing about 30 percent of the labor force. Agriculture contributes 14 percent of GDP and 20 percent of total exports and foreign exchange earnings; industries linked to agriculture, such as processing and marketing, account for another 20 percent of GDP (IFAD 2006). While agriculture uses that much bulk of Egypt's limited water resources, the overall irrigation efficiency at the field level is only about 50 percent (FAO 2005). Because it is almost impossible to increase the amount of water resources available, Egypt is left with only one option for agricultural vertical or horizontal expansions: to improve the productivity and sustainability of its existing water resources.

Background of WB support to the irrigation sector in Egypt

The Irrigation Improvement Project (IIP), implemented by the Ministry of Water Resources and Irrigation (MWRI) between 1994 and 2006, demonstrated the potential for enhancing agricultural productivity and farmer incomes, and hence for alleviating poverty, through physical and operational improvements to irrigation systems. These improvements were expanded in 2007 by the ongoing Integrated Irrigation Improvement and Management Project (IIIMP). In addition, a 6,000 feddan pilot project, called the W-10, was introduced in the tail-end of the canal system through the cooperation of the MWRI, the Ministry of Agriculture and Land Reclamation (MALR) and the Executive Authority for Land Improvement Projects (EALIP). The area of the W-10 has restricted water supply in the peak summer season and had been forced to rely on recycled, highly polluted drainage water. The underlying rationale of the W-10 pilot innovations was that changes that could be demonstrated to work in this challenging region should work elsewhere in Egypt. Lessons learned from the IIP, the IIIMP, and the W-10 has led the MALR to define a set of goals and measures as presented in the Sustainable Agricultural Development Strategy towards 2030 (SADS 2030). Plans for the immediate implementation of the SADS 2030 are formulated in the Sustainable Agricultural Development Business Plan 2010/11–2016/17 (SADBP). As a first step in the SADBP, in 2011 the MALR will begin the implementation of the Farm Level Irrigation Modernization Project (FIMP) to extend the upstream, mesqa (tertiary canal) irrigation improvements of the previous programs to marwas (quaternary canals) and farms. FIMP will scale-up the validated W-10 pilot improvements to an area of about 200,000 feddan (80,000 hectares) and will enhance MALR extension service delivery to extract the maximum benefit for the farm community out of these improvements. By 2017, the SADBP proposes to extend the

irrigation improvements introduced by FIMP and the IIIMP to about 3.5 million feddan of Old Lands. The long-term plan outlined in the SADS 2030 would add an additional 1.5 million feddan of Old Lands to the program by the mid 2020s, creating a total of about 5 million feddan (2 million hectares) of Old Lands with improved irrigation systems.[1] Through the use of these new systems and water management programs, the SADBP seeks to increase field-water-use efficiency from about 50 percent to 75 percent.

As for water quality management, the GOE and World Bank are currently co-financing Integrated Sewerage and Sanitation Improvement Project (ISSIP1) and a follow-on (recently approved) ISSIP2, which aim at treatment of rural domestic sewage within the IIIMP command areas (where otherwise water pollution from untreated/maltreated domestic sewage compromises the irrigation benefits and public health). The ISSIP supports financing conventional WWTPs for the major rural areas, and for smaller areas, finance low-cost community-based solutions (so called "advanced primary treatment" via providing small villages which do not access the public sewers/WWTPs with small compact units that treat sewage before discharging it into the agricultural drains; whereas the assimilative capacity of the recipient drains can improve further the water quality along the drain, upstream the point where its water is being reused in supplementing irrigation). However, ongoing projects such as IIIMP, NDPII and ISSIP, will benefit from EWRMP being an "umbrella IWRM project" that will finance well-thought low-cost-high-reward soft-type investments, that improve synergy between those three projects.

3. Project objectives, beneficiaries and key performance indicators

The Project Development Objectives (PDOs) are to pilot IWRM in the Nile Delta and to enhance the knowledge and capacity of water sector institutions for IWRM in Egypt. Specifically, the project will promote the IWRM principles and practices through: (i) awareness-raising, institutional and capacity strengthening, and demonstration activities implemented in the selected pilot schemes (3 pilots) in the Nile Delta to improve the coordination among water project management units (PMUs for 3 water projects[2]), Government agencies, local authorities and water user associations (WUAs); and (ii) technical assistance (TA), capacity building, training, and provision of equipment to strengthen the capacity and knowledge of the national institutions in water sector and to improve the national water resources monitoring networks.

Project beneficiaries: If the project is implemented successfully and replicated in the entire Delta, a large number of the poor will benefit because they are affected by water related issues such as less access to water and health problems due to polluted water. More specifically, the rural communities which depend on irrigated agriculture will benefit from equity in water allocation and distribution and better quality of the surface water and groundwater. Improved water management will further improve the agricultural productivity and hence farm incomes

[1] The plan would also bring an additional 2.1 million fed of new lands under cultivation by 2017, primarily by using the water savings from the irrigation- infrastructure modernization in the 3.5 million fed of Old Lands.

2 These ongoing projects are the Integrated Irrigation Improvement and Management Project (IIIMP), Second National Drainage Project (NDP2), and the Integrated Sanitation and Sewerage Infrastructure Project (ISSIP)

and rural livelihoods. The improved water quality will protect public health from water born diseases. At the national level, more water will be available to meet the growing water demands by improving the drainage water quality for further reuse which will also protect the ecology of the coastal zones for the benefit of their inhabitants and the rest of the countries around the Mediterranean Sea. Staff of governmental and non-governmental water institutions will receive training to enhance their performance. WUAs and local authorities at the lowest level will be more involved in decision making for water management.

Performance indicators: Achieving the PDO will be assessed through the following indicators: Procedures for institutional coordination in implementing water sector projects have been established and being followed by the agencies concerned to promote the IWRM principles based on testing them in pilot schemes;

Water quality monitoring network has been strengthened and adopted by the agencies concerned through training of government agency staff concerned and provision of monitoring equipment to upgrade the national surface water and groundwater monitoring networks; and

Role of local authorities and involvement of WUAs and other stakeholders has been increased in the pilot schemes to play effective roles in IWRM and pollution control.

4. Project description, components and financing

Project Components

The proposed Project will comprise the following three components:

(a) Component 1: Pilot Schemes (GEF - US$2,684,000; GoE – US$5,974,000, Beneficiaries – US$115,000)

The GEF project is expected to develop synergy between on-going water-sector projects through demonstration activities in a number of pilot areas. Such interventions can help to focus attention and assistance for promoting IWRM. The project will further improve coordination and integration across the ongoing water projects and their implementing agencies. Investments from these projects will be supported by the GEF project to demonstrate synergy of the integration of these sectoral efforts in pilot schemes in the Nile Delta. The resources from these projects do not require change of the scope of their activities since the proposed pilot schemes would add additional inputs and increase their benefits. Wherever possible, pilot schemes will be located within the overlapping project areas of the IIIMP, NDP2, and/or ISSIP and will build on their already planned activities.

This integrated approach is expected to lead to more efficient and effective water resources management, which will result in: (i) maximization of the investment benefits as synergy of the investments will be generated, (ii) strengthened capacity of water agencies, local

authorities and WUAs, and (iii) acceleration of dissemination of lessons and knowledge learned from pilot activities promoted through the GEF project.

Under this component, pilot areas will be selected to improve water management and control pollution by applying the principles of IWRM for sustainable use, reuse and disposal of water. Structural improvements of the irrigation and drainage systems as well as the sanitary conditions offered by the on-going projects will be combined with management tools and institutional arrangements that will maximize their benefits. Thus water availability in terms of quantity and quality will improve with significant gains in productivity, health and environmental conditions. The GEF project will help plan and establish the most efficient sequence of coordinating activities to be implemented by the on-going projects including consultation and participation of local authorities, Branch Canal Water Users Associations (BCWUAs), WUAs and beneficiaries, monitor and evaluate the implementation process, and establish successful procedures for future replication of this IWRM approach in the Nile Delta. The GEF project will provide intensive training for government staff as well as for stakeholders at the lowest possible administrative level including local authorities, BCWUAs, and WUAs in order to facilitate decentralized IWRM as a model that can be replicated in the Nile Delta.

(i) Nekla/Menesi Pilot Scheme

This pilot scheme is located in the West Delta and will focus on improving surface water management in order to increase water use efficiency and improve water quality in the irrigation canals and agricultural drainage networks. This will be done through the integration of innovative technologies and management interventions introduced by on-going projects (i.e. IIIMP and ISSIP) within the pilot scheme. It will further introduce and support management options and institutional arrangements that promote the principles of IWRM and support their implementation. Both the IIIMP and the ISSIP projects aim at improving the quality of water discharges from the irrigated fields and rural settlements, respectively. Hence both projects contribute in improving the quality of the discharges into the drainage network with subsequent improvement of the quality of the re-used drainage water.

IWRM will be enhanced through promoting participatory water management at the lowest level across the water using subsectors. The GEF project will provide an opportunity for the WUAs to play a key role in introducing and applying new concepts and approaches such as continuous flow in the branch canals, controlled subsurface drainage, effective operation and maintenance (O&M) of the newly implemented modern irrigation, drainage and sewerage systems, and interactive communication and coordination with the local authorities. Solid waste management (SWM) is another appealing intervention to both farmers and local governments that would significantly contribute to improving water quality in irrigation canals and drains. The pilot schemes will introduce a model for solid waste management largely operated and maintained by the local communities. Intensive technical assistance, capacity development and training will be provided to the BCWUAs and WUAs to help them to be effectively engaged in water and solid waste management.

Activity 1: Enhanced Surface Water Management – The project will help improve the capacity of the Integrated Water Management District (IWMD) to efficiently and effectively manage irrigation water using the “continuous flow” principle in the branch canals. This will be done by properly allocating irrigation water among WUA members together with appropriate

cropping pattern planning. The project will also facilitate adoption of "controlled drainage" to reduce draining water from paddy fields, which could save significant amount of irrigation water to be applied for the paddy fields. The project will also pilot test the System of Rice Intensification (SRI) in selected mesqas to reduce water consumption in the rice fields of this pilot scheme.

Activity 2: Solid Waste Management – This is an important intervention of the GEF project in the Nekla/Menesi pilot scheme. A solid waste management unit will be established under the respective BCWUAs and its capacity will be strengthened to operate and manage solid wastes. The GEF project will cover the cost of consultants and studies required for the establishment and capacity building of the solid waste management unit within the BCWUAs. A feasibility study will be carried out on this activity before commencing any intervention. Local government will be involved in carrying out this activity as a prime agency responsible for solid waste management. The IIIMP will cover the cost of civil work and equipment for solid waste management. The expected results are higher hydraulic efficiency of drains and canals; a significant improvement of water quality particularly in drains and eventually improved health and environmental conditions; and availability of more drainage water for reuse.

Activity 3: IWRM Monitoring by GIS – The project will provide IWMD with geographical information system (GIS) in order to monitor irrigation water allocation, water requirement, water quality, cropping pattern, harvesting time, extension of crop disease, extension of crop damage by insect, collection of water charges, etc. The IWMD will be equipped with GIS computer and its staff will be trained to use the GIS. The District Water Board (DWB) and BCWUAs will also be trained to use the GIS to work with IWMD in planning water allocation and cropping patterns. Such training will be carried out in parallel with training under Activity 1.

(ii) Okda/Tellin Pilot Scheme

This pilot scheme is located in the East Delta and will focus on drainage water and groundwater management which is affected by surface water and land uses causing pollution from agricultural, municipal and industrial sources. Thus, this pilot scheme is selected in an area where drainage water and a fresh groundwater aquifer co-exist. The potential of improved water management introduced by the on-going project (i.e. NDP2) will be enhanced by adopting good practices that protect drainage water and groundwater from pollution sources such as domestic and industrial sources as well as poor disposal of solid waste. This component will provide an opportunity for WUAs to be engaged in a participatory effort to protect drainage water and groundwater against pollution. Local authorities and WUAs will be strengthened through intensive technical assistance, capacity development and training at this pilot scheme. The WUAs are expected to take a leading role in monitoring and evaluation of drainage water and groundwater in the area.

Activity 1: Environmental Impact Assessment: The first step towards pollution control and water quality improvement is to carry out environmental impact assessment (EIA). Based on the EIA, an environmental management plan (EMP) will be prepared. The GEF project will help the Environmental Unit of EPAD and the IWMD to carry out field survey of environmental impacts and sampling of water quality information of Okda and Tellin drains,

carry out the EIA and prepare the EMP with the involvement of the local communities and local authorities. The EIA will identify the main sources of pollution, the state of water quality (measuring water quality parameters), extent of law enforcement, and compile findings in an EIA report. The EMP will identify mitigation measures for pollution reduction in drains including solid waste management, low-cost in-stream and/or off-stream cost-effective treatment technologies as well as awareness campaign programs and collective and cooperative measures by local communities. The GEF project will continue to support the Environmental Unit of EPAD to monitor and follow up the implementation of the EMP.

Activity 2: Institutional Strengthening and Capacity Building – The project will help improve capacity of the IWMD and EPADP local and central departments in efficiently and effectively maintaining the drainage systems. The project will also help establish a District Water Board which will be involved in planning, design and implementation of the in-stream wet land to be carried out by the NDP2.

Activity 3: Solid Waste Management: The GEF project will help establish a solid waste management unit in the BCWUAs of the Okda/Tellin pilot scheme. Local government will be involved in implementation of this activity as the prime agency responsible for solid waste management. The project will provide TA (solid waste management and community mobilization consultants) to advise and propose the required processes, technology, machinery and equipment, as well as the design and establishment of the solid waste management unit. Simple equipment such as small trucks and training for the BCWUAs staff will be provided by the GEF project. Construction of civil works, if required, will be carried out under the NDP2.

Activity 4: Pollution Reduction Intervention Support – The project will support the NDP2 in identifying small-scale and cost effective interventions that suit the specific conditions of the pilot area, such as in-stream wetlands, train the local communities in operation and maintenance of such facilities built by the NDP2, and train the local authority in water quality monitoring and enforcement of regulations.

Activity 5: Public Awareness Campaign for Compliance of Environmental Regulations – The project will carry out a public awareness campaign to disseminate information on relevant regulations relating to the environment, waste avoidance, recycling, and environmental health, and improve understanding and support for compliance (protection of health and the living environment of stakeholders).

(iii) Khadrawia Pilot Scheme

This pilot scheme is located in the Central Delta and will focus on drainage water management. The Khadrawia drain has been heavily contaminated by untreated sewerage discharges from the neighboring villages, massive agricultural and domestic solid wastes, and untreated industrial waste water from the nearby industrial zone. Since the pollution level is severe, this pilot project will focus on the study to identify options for possible interventions by future project and awareness campaign for the stakeholders and local populations.

Activity 1: Stakeholder Analyses – The project will provide technical assistance to carry out stakeholder analyses, which will identify the polluters and the affected people and establish a forum for communication between them. This will facilitate discussion concerning the best option to resolve the long-standing and serious problem of industrial pollution in the Khadrawia drain.

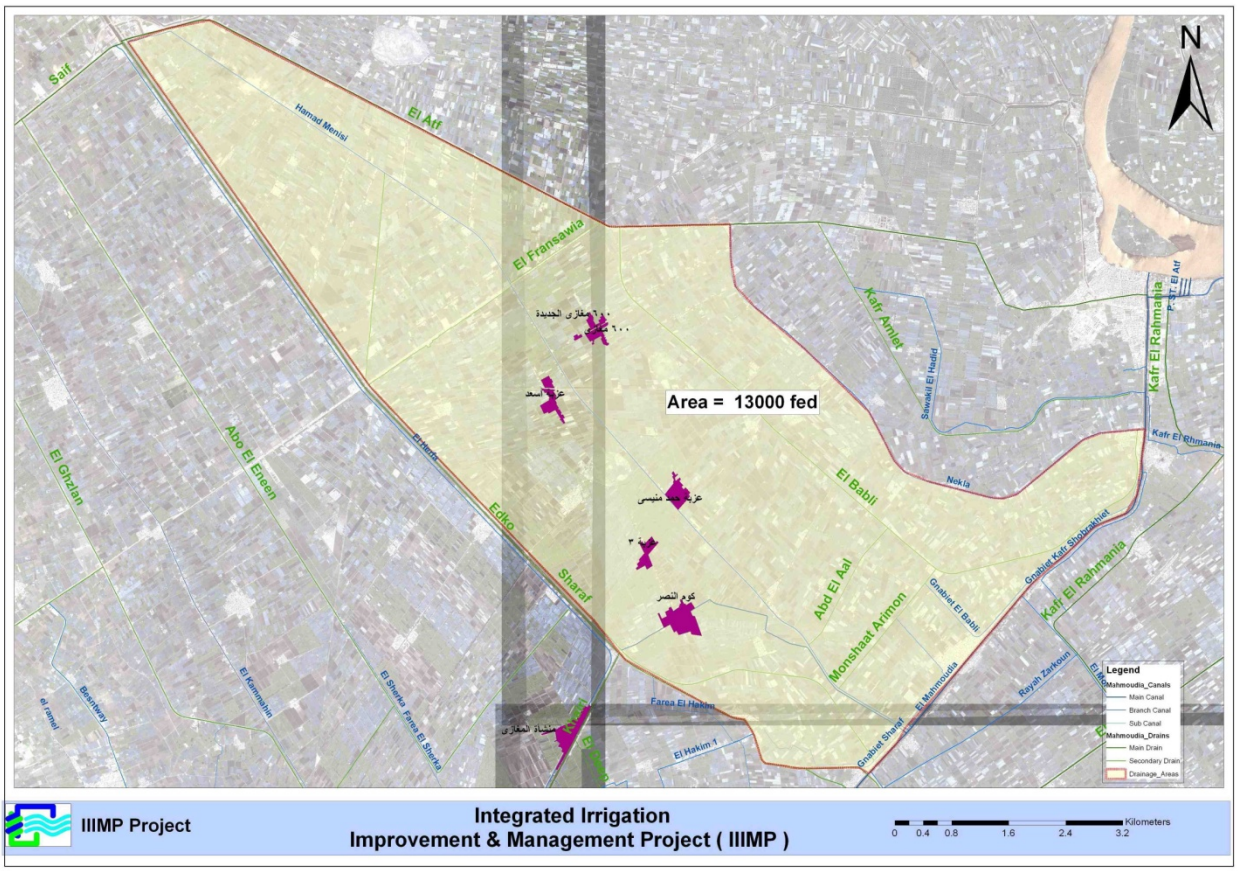
Activity 2: Study for Environmental Impact Assessment and Financial Options to Resolve Drain Pollution – The project will also provide technical assistance to carry out a study to identify possible financial options to resolve this drain pollution. The study will do this by conducting EIA and economic feasibility options. Potential financial options will be discussed in the forum established under the stakeholder analysis. The EIA will also update the existing EMP to address the necessary follow-up mitigation actions to be carried out by NDP2.

Activity 3: Study for Resolving Pollution in the Drains – The project will carry out a study to investigate the most viable option for resolving pollution in the drains, possibly construction of in-stream wetlands, which will be tested under the NDP2. The local communities will be involved in the preparation and implementation of such intervention so that the communities would have sense of ownership of the system built and operate and maintain after its completion.

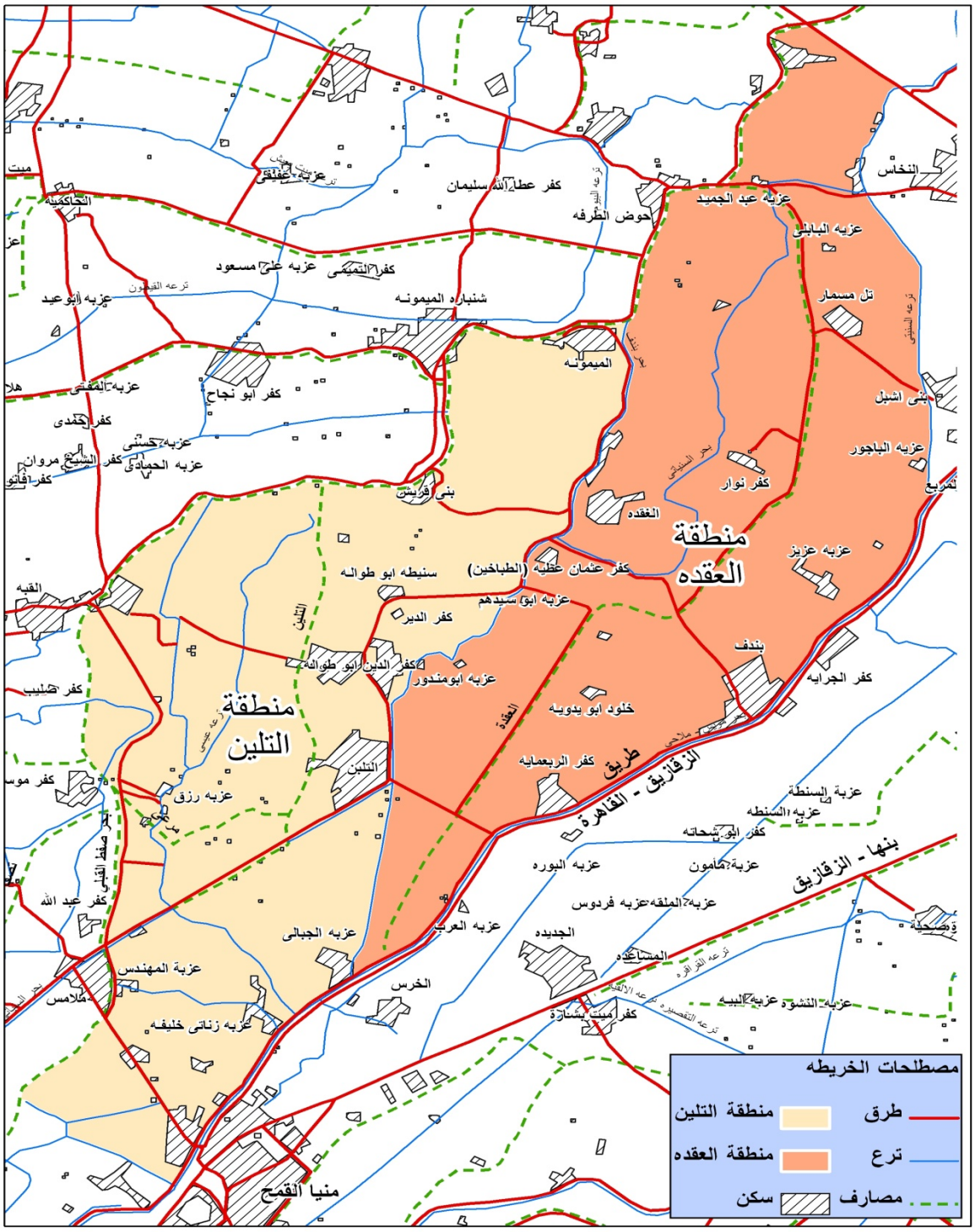
Activity 4: Institutional Strengthening and Capacity Building - The project will help improve the capacity of the IWMD and EPADP local and central departments to efficiently and effectively maintain drainage systems. The project will also help establish a DWB which will be involved in planning, design and implementation of the in-stream wet land to be financed under the NDP2.

Activity 5: Public Awareness Campaign for Compliance of Environmental Regulations. - The project will carry out public awareness campaign to disseminate information on regulations dealing with the environment, waste avoidance, recycling, and environmental health, and also improve understanding and support for compliance with the regulations (protection of health and the living environment of the stakeholders).

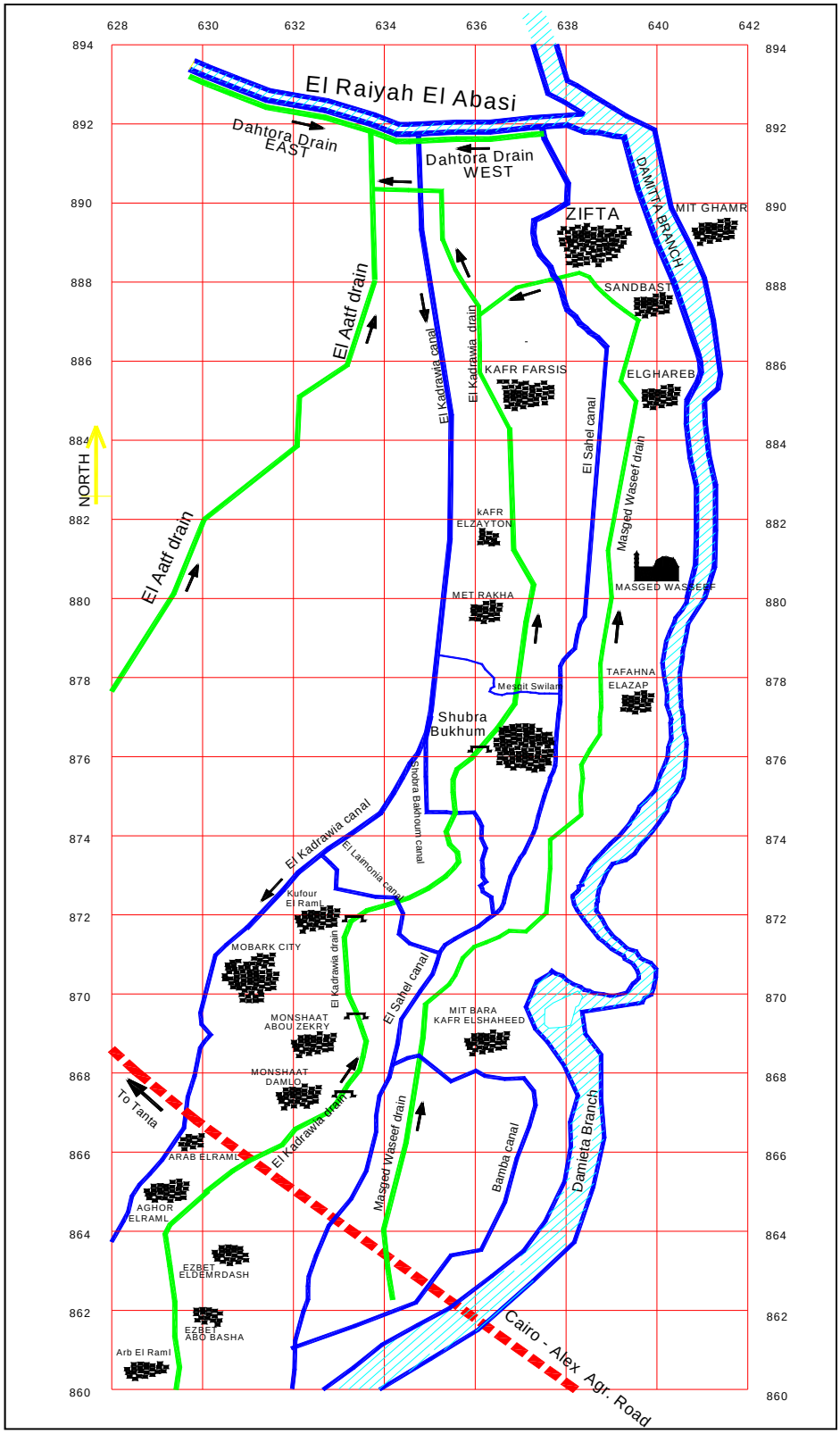
Stakeholder consultations on the proposed activities in the three pilots were completed by MWRI in June and August 2011, as summarized in the Annex. The following maps show the location of the three pilot schemes.



Nekla/Menesi Pilot Scheme



Okda/Tellin Pilot Scheme



Khadrawia Pilot Scheme

(b) Component 2: Capacity Building for Surface Water and Groundwater Management and Monitoring (GEF – US$3,443,000; GOE - US$607,000)

Under this component, the GEF project will assist the government agencies concerned to strengthen their institutional and technical capacity and knowledge in monitoring and managing the surface water and groundwater more effectively and efficiently across sectoral borders. As a result, this component will enhance the management of water resources at the macro level in order to improve water availability in terms of quality and quantity in response to growing water scarcity and climatic variability including flood and drought and thus contribute significantly to reducing pollution and improving the health of the Mediterranean ecosystem and its biodiversity resources. This component will optimize the availability of water taking into consideration the impact of climate change in the management of surface water, groundwater and Lake Nasser. This component will include provision of monitoring equipment, training and modelling, and carrying out strategic studies addressing priority issues, to make the most of the scarce water resources available to Egypt from the Nile River. The activities of this component will include:

(i) Evaporation Losses Analysis Study in Lake Nasser

This study will determine the monthly evaporation parameters, impact of changing High Aswan Dam (HAD) operation rules on the evaporation losses, and the total expected losses due to different future scenarios of low or high inflows. The study will carry out an accurate estimation of lake evaporation losses. The Nile Research Institute (NRI) of the NWRC will carry out this study in collaboration with the HADA.

(ii) Climate Change Impact Assessment Study in Water and Agriculture in the Nile Delta

This study will assess the impacts of climate change on water and agriculture in the Nile Delta including the impacts of rising sea water causing salt intrusion in the coastal Delta region, and the impacts on land use due to increased temperature and changing water availability in the Delta. The Environment and Climate Change Research Institute (ECRI) of the NWRC will carry out this study in collaboration with the Planning Sector.

(iii) Surface Water Modeling Analysis Study in the Nile Delta.

This study will update the information for surface water modeling (Decision Support System [DSS]) to reflect new changes since 1977 in order to ensure effective planning and management of surface water resources. The Drainage Research Institute (DRI) of the NWRC will carry out this study.

(iv) Groundwater Modeling Analysis Study in the Nile Delta

This study will analyze the impact of sea water level rise on groundwater in the Nile Delta and prepare mitigation measures in order to cope with the climate change. The Research Institute for Groundwater (RIGW) of the NWRC will carry out this study.

(v) Surface Water Quality Monitoring Capacity Enhancement in the Nile System

This subcomponent will help enhance the capacity of GOE staff by training and improve effectiveness of surface water monitoring network by providing necessary monitoring facilities in strategic locations. The NWRC will lead this activity in coorperation with NRI and DRI.

(vi) Groundwater Quality Monitoring Capacity Enhancement in the Nile System

This subcomponent will help enhance the capacity of the GOE staff by training and improve the effectiveness of the groundwater monitoring network by providing necessary monitoring facilities. The Research Institute of Groundwater (RIGW) of the NWRC will lead this activity in cooperation with the Groundwater Sector of the MWI.

(c) <u>Component 3: Project Management (GEF – US$554,000; GOE - US$227,000)</u>

Considering its broad scope and the large number of stakeholders to be involved in implementation of this project, it is crucial to have an effective project coordination unit (PCU). The PCU will be established under the Planning Sector of MWRI headed by a Project Director, an Irrigation/drainage specialist, a procurement specialist, a monitoring and evaluation specialist and a water resources specialist, and supported by two local consultants (a social scientist and financial management specialist). Also, it is expected that the project will generate a lot of useful information, improved knowledge and strengthened capacity for IWRM. In this regard, this component will provide support for PCU and facilitate knowledge sharing. It will include the following:

(i) Project Coordination Unit (PCU) – investment to strengthen the PCU; and

(ii) IW Learn – a tracking tool for reporting and disseminating lessons learned, and investment for sharing information at the international water conferences.

The PCU will be supported by the Central Directorate for Irrigation Advisory Service (CDIAS) in community development activities under Component 1. The Project will provide necessary support for PCU activities in terms of per diem of the PCU staff, fuel to travel to the pilot sites, recruitment of local consultants, and required cost of stakeholders meetings.

This component will also house the Environmental Management Unit (EMU) and finance its ESMF incremental operating costs (see ESMF organogram and budget below).

Project financing and lending instrument

The proposed project would be funded by the GOE and the GEF. The total cost of US$13.6 million will be funded by: (i) a GEF grant of US$6.681 million, (ii) a GOE of US$6.808 million, and (iii) a beneficiary contribution of 0.115 million.

Project Cost and Financing (US$'000)

Project Components	Project Cost	GOE Financing	GEF Financing	Beneficiaries Contribution	Financing %
1. Pilot Schemes	7,215	4,907	2,208	100	53
2. Capacity Building for Surface Water and Groundwater Management and Monitoring	3,465	520	2,945		25
3. Project Management	781	227	554		6
Total Baseline Costs	11,461	5,654	5,707	100	82
Physical contingencies	1,146	565	571	10	8
Price contingencies	997	589	403	7	9
Total Project Costs	**13,604**	**6,808**	**6,681**	**115**	**100**

- **ESIA and ESMF: Approach and impact matrix**

The Project incremental activities pose no significant negative impacts

As described above, the incremental activities financed by the GEF Project will mostly be of the low-cost soft-type (TA, training, operating costs), with few goods (US$0.4m in Okda pilot area). Thus these activities do not have significant negative impacts. Whereas, any associated impacts resulting from IIIMP, ISSIP or NDPII will be adequately dealt with by their existing ongoing EMPs and RPF. Nevertheless, the only incremental hard-type intervention that may be attributed to this GEF Project could be the planned intervention in El-Khadraweya pilot, as the Project will study the options (e.g. in-stream wetland vs. off-stream treatment) and select the best option (in Component 1). The civil works of the latter will be financed by NDPII and not by the Project. At the time of preparing NDPII, its EMP did not envisage that NDPII could invest in a physical solution in El-Khadraweya. Hence the ESMF of EWRMP Project will support NDPII-EMU to ensure safe disposal of the solid/liquid pollutants that will be captured by the solution. Any hazardous/non-hazardous wastes will be disposed per the WB/IFC "Environmental Health Standards" (EHS). Collected wastes are to be sampled, analyzed, and all pollutants exceeding the ambient water standards should be disposed at least 300 meters from waterways, farmer lands and wildlife habitats, or dumped in properly-located landfills.

As for the social safeguards, no negative impacts were envisaged at project appraisal/negotiation. Subject to the detailed design stage and Site-specific EAs (after the Project starts), in the unlikely case that a negative impact may occur in a given site (e.g. temporary loss of private incomes), the mechanisms indicated in the Resettlement Policy Frameworks (RPF) for IIIMP, ISSIP, and NDP2 will be implemented.

5. WB safeguards policies relevant to the EWRMP Project

ESA/ESMF OP4.01: As there are no significant negative impacts envisaged from the Project incremental activities, the ESMF will focus on: (1) monitor impacts on ambient water quality and public health in areas adjacent to the 3 pilots including areas close to the Northern Lakes (under Component 2, through NWRC coordinating with NDP2 and IIIMP M&E Units); and (2) empower MWRI's Planning Sector and the EMU of NDPII to address the water-quality aspects of IWRM.

Involuntary Resettlement OP4.12: is not triggered, as EWRMP will support soft-type activities. Any civil works, and any associated activities that would require land acquisition, will be implemented by one of the projects that EWRMP is supporting: IIIMP, ISSIP and NDP2. In particular, solid waste management may require landfill for storing and processing collected solid waste. If instream wetlands are built for improving drain water quality, then land maybe needed for drying sludge. It is expected that such land will be provided through voluntary donations arranged by the local communities. Any land acquisition will be performed in accordance with the RPF for IIIMP, ISSIP, and NDP2.

Pest Management OP 4.09; is not triggered. The EA for IIIMP found that IIIMP was not expected to contribute to any significant increase in pesticide use, and so OP4.09 would not be triggered in IIIMP, and similarly EWRMP is not expected to make any changes that would lead to increased pesticide use. However, the Project includes public awareness activities that can contribute to rationing the use of pesticides and to proper disposal of used containers.

International Waterways OP7.5; Has been triggered because the Nile is an international waterway; but an exception to the notification requirement has been obtained from the Bank. Nevertheless, as per OP7.50 (paragraph 7b) the MWRI team will be responsible for examining any potential riparian aspects, and for acting accordingly.

Safety of Dams OP4.37; Natural Habitats OP4.04: None of these policies (which may typically be triggered by conventional WRM/irrigation operations that provide incremental financing of hard-type investments) will be triggered by the Project.

Summary of WB Safeguards triggered in IIIMP, ISSIP and NDPII

Safeguard Policies Triggered	IIIMP	ISSIP	NDPII (AF)
EA (OP/BP 4.01)	Yes, extensive ESMP exists covering: (1) mainstreaming (=mitigate environment externalities posed onto project, including solid wastes) and (2) mitigating impacts from project (including component-specific/site-specific EAs). IIIMP operates in the Nekla pilot area of EWRMP.	Yes, ESMP exists. ISSIP operates in Nekla pilot area of EWRMP.	Yes, EMP exists, focusing on water quality monitoring in the improved drains and ambient waters. NDPII operates in Khadraweya and Okda/Teleen pilot areas of EWRMP.
Pest Management (OP 4.09)	No, but ESMP has a basic Pest Management Plan	No	No
Physical Cultural Resources (OP/BP 4.11)	No, but per the revised ESMP, works contracts include "chance find" clauses	No	No, but works contracts include "chance find" clauses
Involuntary Resettlement (OP/BP 4.12)	Yes, with RPF, including "crop-loss compensations"	Yes, with RPF	Yes, with RPF, including "crop-loss compensations"

6. Environmental and Social Management Framework (ESMF): Impact and Action Matrix

This document is deemed an ESM "Framework", because Site-specific EA/EMPs will be undertaken under Component 1 for each of the 3 pilots[1], which will help determine, *inter alia*, the best set of SWM interventions. These (pilot) Site-specific EA/EMPs will be conducted as

[1] The Site-specific EA/EMP for Nekla pilot does not show up amongst the activity description under Component 1, since it will be financed by (the ESMP budget of) IIIMP.

per the WB operational policies and guidelines (including consultations and disclosure). A Draft Table of Contents of the TOR for these Site-specific EAs/EMPs is provided in Annex 3.

The ESMF will mainly comprise: **(1) Monitor impacts** on ambient water quality and public health in areas adjacent to the 3 pilots including areas close to the Northern Lakes (under Component 2, through NWRC coordinating with NDP2 and IIIMP M&E Units); **(2) Empower MWRI's Planning Sector (PS) and the EMU of NDPII** to address the water-quality aspects of IWRM, including SWM (in Component 1) and any riparian aspects (based on the results of Lake Nasser evaporation study under Component 2). As such, the EMU of NDPII will act as the *defacto* EMU of GEF-EWRMP only as regards the two drainage-related pilots in Component 1: Khadraweya and Oqda/Teleen.

Solid Waste Management in relation to Project design *vis a vis* the ESMF

- SWM is a core Project activity leading to its PDO (indicator #3: "WUAs trained on IWRM including pollution control"), rather than a mitigation of Project impact. Hence, the SWM activities budgeted at $1.6m are deemed exclusive of the ESMF budget ($0.75m, see below).
- The Project's GEF-financed incremental SWM activities (in Component 1) are mostly of the soft-type, such as TA and training (in all 3 pilots), apart from small equipment ($400,000 only in Okda/Teleen pilot). Whereas, the hard-type/physical SWM interventions will be financed by IIIMP and NDP2 in Nekla and Khadraweya pilots respectively (TBD based on the Site-specific EAs; e.g. BCWUA tractors or landfill works in Nekla). The SWM-related activities for Khadraweya pilot will all be of the soft-type, GEF-financed (TA, training, monitoring, for safe disposal of the liquid or solid wastes that will be captured by the to-be-selected physical intervention on this drain). Land for landfills will be a public land or donated by the local elites. Hence, safeguards wise, the Project is categorized "B".

- The purpose of these SWM activities is not processing or recycling the collected waste. The purpose (to fulfill the PDO) is to safely take away the wastes from the irrigation and drainage canals supported by IIIMP and NDP2, so they can function as designed. However, if during Project implementation, based on the findings of the Site-specific EA, the Project finds that WUAs are interested in composting, reusing or selling processed waste (and that these "byproducts" essentially encourage them to keep the canals/drains clean), the Project would in this case elevate its engagement in SWM by supporting the WUAs to implement waste processing and recycling/marketing in the 3 pilots. In this case, there would be higher risks warranting a different level of prevention/mitigation/monitoring (currently not addressed in the Project appraisal documents); and hence, in this case the Project would be restructured, and its safeguards Category would be raised from "B" to "A".

Example of soft-type SWM activities financed by GEF in Okda/Teleen and Nekla Pilots.

1. Technical Assistance
SWM International Consultant (Prefeasibility Study & Start-up)
Composting International Consultant (Specialized Agency)
National Consultant (Composting and Vermi-composting)
National Consultant (Sociologist)
2. Training
Public Awareness (wastes disposal/classification)
Workshops, Meetings, symposium
Composting Demonstrations
Demonstration Visits to Other Egypt SWM/Composting Sites
3. Start Up Operational Costs for BCWUAs

Low-cost SWM equipment (maximum $400,000 per pilot area, TBD based on above Site-specific EA and training) will be financed by IIIMP in Nekla and by GEF in Okda/Teleen (as this type of expenditure is ineligible by NDP2, and IIIMP does not operate in Okda/Teleen).

Example of SWM equipment/works to be financed by IIIMP in Nekla pilot (TBD, awaiting the results of a "Site-specifc EA/EMP" in Nekla funded by IIIMP).

1. Equipment/works for waste collection and safe disposal: handling equipment, collection containers, trucks (10 ton capacity), tractors, motorized tri-cycles, civil work for landfill for inorganic waste (land will be public land or donated by the local elite); and
2. Equipment/works for waste processing and recycling: (P.S. supporting these would require Project restructuring and safeguards raised from Category "B" to "A"): Sludge collection trailers, composting and packing equipment, civil works for vermin-composting terrain (land for vermin-composting or sludge drying will be public land or donated by the local elite).

World Bank EHS Guidelines in relation to SWM

All of the SWM activities will be guided by and comply with the WB/IFC Environmental Health Guidelines (EHS), as listed in Annex 2. The waste collected from the waterways will be disposed in duly authorized and regulated landfills, in compliance with the Egyptian regulations.

ESMF Matrix: likely impact, mitigation, monitoring, training

Likely impact	Prevention/Mitigation	Monitoring	Capacity Development and Training	Focal Responsibility	Cost	Timeline
Component 1: 3 pilots require safe disposal of the captured solid or liquid wastes	For the 2 pilots in Khadraweya and Oqda/Teleen, Project (Component 1) will prepare feasibility study and Site-Specific EIA to support NDPII in defining the pollution sources and hence selecting the best interventions. NDPII will implement the elected physical interventions, and EWRMP will safeguard safe disposal of the captured liquid and solid wastes. Local communities will be involved in preparing, implementing and O&M of the elected interventions. For SWM in Nekla and Oqda/Teleen, the Governorates (being responsible for SWM) represented by the local councils, will be involved in carrying out the selected	The PS-PCU M&E Unit will lead the ESMF-M&E, in coordination with IIIMP, NDPII, ISSIP, and NWRC (Component 2). ESMF will monitor impacts on ambient water quality and public health in areas adjacent to the 3 pilots, including areas close to Northern Lakes. See ambient standards per Law 48 in the Table below. Key parameters monitored are (see Table below): in-stream DO (mg/l), BOD (mg/l), solid waste collected (ton), organic waste collected (ton). Monitoring frequency: once a year, by February (as part of the Project-wide annual M&E reports).	For the 2 pilots in Oqda/Teleen and Nekla, Project (Component 1) will train BCWUAs in collecting solid wastes away from the irrigation & drainage systems, sort them into organic waste (about 60% of total waste in rural area), reusable waste (paper, metal, glass, plastic), and refuse. For the 2 pilots in Oqda/Teleen and Khadraweya, Project (Component 1) will hold public awareness campaign for Compliance to Environmental	PS-PCU (TA, operating cost) for: (1) most training; (2) pilot-specific studies (except Nekla, to be done by IIIMP); and (3) its M&E unit to consolidate annual M&E reports including on ESMF/EMPs progress. NDPII for safe disposal of captured waste in Khadraweya and Oqda/Teleen (operating cost, equipment). IIIMP for the	Mitigation: US$260,000 (for TA and incremental operating cost; excludes SWM). Monitoring: US$300,000 (equipment, TA studies, operating cost). Capacity development and training: US$190,000	Pilot-specific studies: starts early CY2012; mostly completed by early CY2013. Monitoring and training: starts early CY2012; onwards. Mitigation: starts CY2013; onwards.

	SWM activity. For Nekla SWM, Project incremental SWM activities (in Component 1) will only be of the soft-type such as TA and training (as the hard-type SWM interventions like procuring BCWUA tractors or landfills will be financed by ongoing IIIMP and ISSIP). For Okda/Teleen SWM, Project will finance TA, training and small equipment (TBD, $400,000). In all 3 pilots, Project will ensure safe disposal of any hazardous or non-hazardous wastes as per the WB-EHS (at minimum at 300 meters from waterways, farmer lands and wildlife habitats, or to be dumped in properly located landfills). Land for landfills will be public land (by local the government) or donated by the local elites.	Collected (hazardous/non-hazardous) wastes are to be sampled, analyzed, and all pollutants exceeding the ambient water standards should be disposed per the EHS.	Regulations, including disseminating info on these regulations, waste avoidance/recycling, and environmental health, and improve understanding and support for compliance. Project will also train the local authorities on water quality monitoring and enforcement of environment regulations.	pilot-specific EMP for Nekla; and thereupon, for safe disposal of captured waste in Nekla (operating cost, equipment). NWRC for most monitoring (operating cost, TA, equipment); to inform the annual M&E reports consolidated by the PS-PCU M&E Unit.		
Component 2: Potential international	As per OP7.5, MWRI/Project to examine any Project-related issues as	NWRC to undertake the related monitoring for Lake Nasser, as	MWRI-PS to undertake the related training, as	MWRI-PS as to water balance in lake Nasser,	TBD	CY2013 (only if applicable)

water aspects	to the riparians or as to the Northern Lakes (e.g. depending on results from the NWRC-sponsored study on evaporation losses in Lake Nasser, Component 2).	applicable (depending on the results of the evaporation study).	applicable.	and any related training. NWRC to supervise the lake study, and thereupon (if needed), does monitoring and additional research (to inform MWRI-PS).		

Monitoring and Evaluation

Establishing Monitoring and Evaluation System (MES): The Project-wide M&E system (MES) would be developed (in PS-PCU M&E Unit) to integrate with the NWRC's monitoring efforts (component 2) and with the on-going computerized MESs of IIIMP, ISSIP, and NDPII, which would be expanded to cover the EWRMP Project. The Project-wide MES will include monitoring progress on implementing the ESMF and the Site-specific EMPs (including their related indicators, indicatively listed in the Table below), as part of the Project-wide annual M&E report (by February every year).

Institutional Responsibilities: Component 2 includes significant provisions for strengthening and expanding existing national level monitoring network. The NWRC operates this existing network and carries out routine measurement. Periodical reports summarizing the status of the water quality nationwide are being published by the NWRC. The Project's M&E system and database will coordinate with these monitoring efforts of NWRC, and will be maintained by PCU of PS, and applied by the decision makers and PMU staff in IIIMP, ISSIP, NDPII, and related six research institutes under NWRC, and PCU of PS. All project management offices would designate specific units and/or staff to be responsible for these functions at the field (and higher levels as appropriate) and at their various levels for the data collection and entering data in the MES, ensuring its accuracy and quality and undertaking analysis as needed for evaluation of project outputs and outcomes, and producing the required monitoring reports to PCU of PS in MWRI. MES responsibilities of the PCU would include: (a) formulating uniform M&E standards and key indicators system, and supervising implementation and operation of the MES; (b) training, guidance, supervision and inspection of lower-level MES institutions and personnel; (c) carrying out field inspections, consolidation of data, studies on important issues and report writing; and (d) provision of MES data and annual reports to the Bank.

M&E Reporting and frequency: The PS-PCU M&E Unit will submit a monitoring report (using the MES, consolidating M&E reports from IIIMP, ISSIP, NDP2, and 6 related NWRC research institutes) to MWRI and to the Bank, once a year, by February 15. The Project-wide annual M&E report should include (i) project progress with key outputs and outcome indicators compared with planned targets, (ii) problems identified and recommended actions to address them, and (iii) status of beneficiary consultations and their feedbacks. The annual M&E reports should also include the special surface water and groundwater quality monitoring reports, with monitoring results from the identified monitoring sites under three GEF pilot schemes. Also the reports on "Feasibility Study on Solid Waste Management", "Stakeholder Analyses in Khadrawia Pilot Scheme ", and "Financial Options to Resolve Drain Pollution" should be completed and submitted to the Bank by December 30, 2012.

Key M&E indicators for the ESMF: These are shown in the Table below (to be updated/expanded based on the Site-specific EAs/EMPs).

Pilot Area	Indicator	Baseline	Target year 1	Target year 2	Target year 3 (Project target)
Nekla canals	Solid waste collected (ton).	0	0	1,800	2,500
	Organic waste collected (ton).	0	0	1,600	2,300
Khadraweya drain	DO (mg/l)	1	1.5	2.5	4
	BOD (mg/l)	216	200	160	30
Okda/Teleen	Solid waste collected.	0	0	1,800	2,500
	Organic waste collected.	0	0	1,600	2,300
	DO (mg/l)	1	1.5	2.5	4
	BOD (mg/l)	216	200	160	30
Other (TBD by the Site-specific EAs)	TBD: e.g. other ambient parameters based on the Table below (Law 48).	TBD	TBD	TBD	Not to exceed Law 48 standards

Ambient water-quality standards (Egypt Law 48/1982)

Parameter name	Abbreviation	Nile and Canals (mg/l)	Drains, Ponds and Lakes (mg/l)
Acid balance	PH	7 < pH < 8.5	7 < pH < 8.5
Alkalinity Total		20 < alkalinity < 150	
Ammonium	**nh_4-n**	0.5	
Arsenic	As	0.05	
Biological Oxygen Demand	**bod**	6	
Cadmium	Cd	0.01	
Chemical Oxygen Demand	**cod**	10	
Chromium	Cr	0.05	
Coliform bacteria (total)			5,000 **mpn/100**ml
Colour		< 100 degrees	
Copper	Cu	1.0	
Cyanide		0.11	
Fluoride	F	0.5	
Grease and Oil		0.1	

Industrial detergents		0.5	0.5
Iron	Fe	1.0	
Lead	Pb	0.05	
Manganese	Mn	0.5	
Mercury	Hg	0.001	
Nitrate	**no_3-n**	10	
Organic Nitrogen	**n-org**	1.0	
Oxygen (dissolved)	**do**	5.0 (minimum)	4.0 (minimum)
Phenol		0.02	0.005
Selenium	Se	0.01	
Sulphate	**so_4**	200	
Temperature		5 degrees C above normal	5 degrees C above normal
Total Solid Materials	**(tds)**	500	650
Turbidity			50 **ntu**
Zinc	Zn	1.0	

7. Integrating the ESMF into the Project: budget and organigram

The ESMF budget is $0.75m (including contingencies), financed mainly by GEF under the three Project Components as follows:

- Component 1 (3 Pilots): finances the ESMF TA consultancies and goods/equipment;
- Component 2 (led by NWRC): ESMF monitoring activities will be undertaken under the Project-wide M&E activities, led by NWRC and coordinated by the M&E Unit of PS-PCU; and
- Component 3 (PCU): Finances most of the ESMF incremental operating costs (field visits, water quality sampling, training, etc).

ESMF budget breakdown: The ESMF budget is allocated mainly to the PS EMU/M&E Unit (overall project), and partly to the NDPII-EMU (Component 1) and NWRC (Component 2). Refer to the Organogram below.

No	Item	Required Budget			Notes
		2012	2013	2014	
1	Goods and equipment (for monitoring)	11,750	70,000	55,000	Excluding SWM
2	Local Training and workshops	20,000	10,000	10,000	
3	Overseas Training	18,000	36,000	18,000	
4	Public awareness (other than training)	28,000	28,000	18,000	
5	Site-Specific EA/EMP consultants	65,000	30,000	0	Under MWRI-PS

					(but under IIIMP for Nekla pilot)
6	Component 2: Environmental studies, including water quality monitoring	110,000	110,000	110,000	Separated since it is under NWRC
7	Total ESMF budget without SWM	222,780	284,000	211,000	Total ESMF US$750,000 (including contingencies)
	SWM (including $400,000 equipment for Nekla funded by IIIMP and $400,000 for Okda by GEF)		810,000	810,000	Not added to ESMF total as it is a core Project activity, rather than a mitigation

ESMF Organogram (Institutional Setup for implementing the ESMF)

The coordinator of the PCU at the Planning Sector (PS) of MWRI will work as a part-time Environmental Specialist, to follow up the ESMF in cooperation with NWRC and the EMUs of IIIMP, NDP2 and ISSIP. The EMU of NDPII will be the defacto EMU for GEF-EWMP only as regards the two drainage-related pilots in Component 1: Khadraweya and Oqda/Teleen.

Figure 1: Institutional Setup for EWMP-EMP Implementation and Reporting

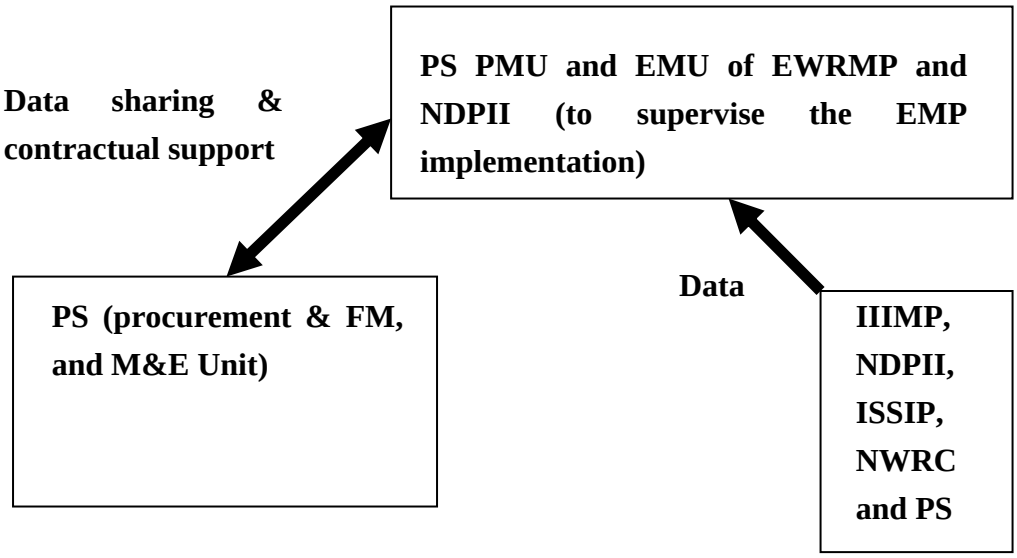
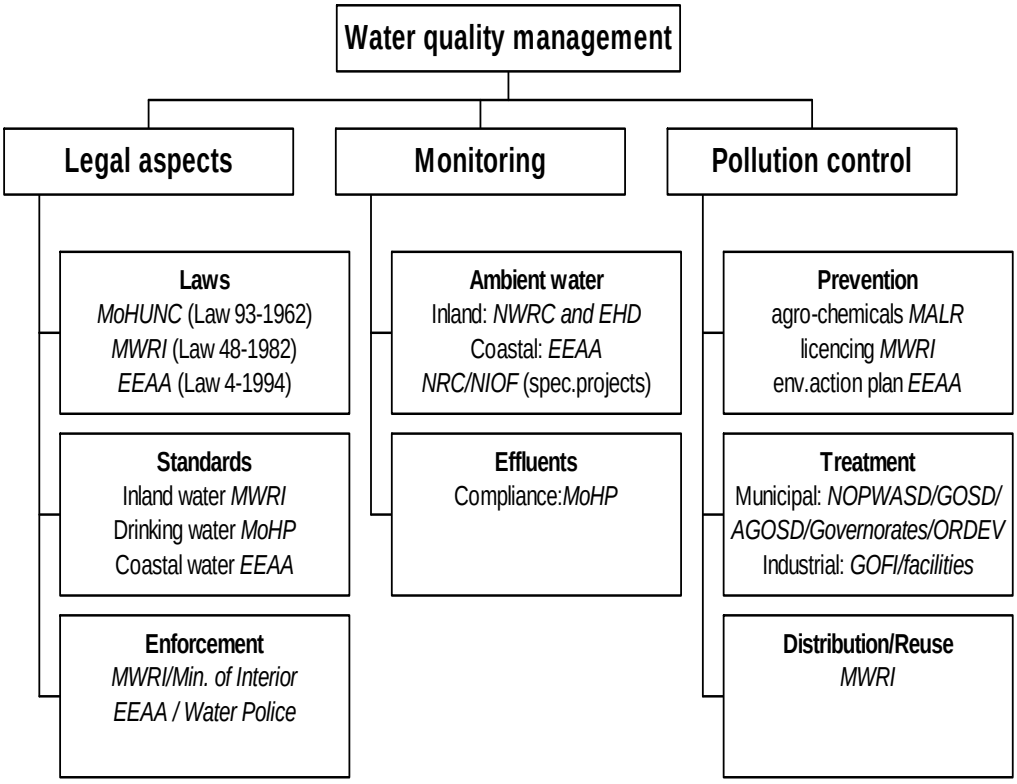


Figure 2: Organigram for Water Quality Monitoring and Compliance in Egypt



Supporting the EMU/EMP of NDPII

Empowering the EMU of NDPII can result in a far reaching outcome, that is: creating a strong environmental unit EU within MWRI's Drainage Authority (EPADP, the implementing agency of NDPII, which also coordinates with MWRI the drainage-related activities of IIIMP). The activities under GEF-EWRMP component 1 coincide with the EMP for NDP2-AF. Most of the activities for Khadraweya and Okda & Tellien pilots will be carried out by EPADP-NDPII (including EMU of NDPII). Since funding from NDP2 is limited to civil works and few goods, the NDP2 budget will not be sufficient to ensure proper capacity building for its EMU. Thus provisions from the GEF-EWRMP are made for TA and goods to ensure that the EMU of NDPII (and EU of EPADP) will be able to carry out its responsibilities under both projects. The Table below summarizes the EMP of NDPII (which as indicated above would be underfunded without EWRMP). As such, the EMU of NDPII can function as the EMU for both EWRMP and NDPII (see ESMF organogram below).

	Environmental Issue	**Mitigation Measure**

1	Water Quality in General	- Monitoring drains in general; - Monitoring drains, effluents, at mixing points in priority areas
2	Industrial discharge in drains	- Determine / estimate concentration, load and impact - Enforce regulatory framework - Keep tight database of pollution loads and violations
3	Domestic discharge in drains	- Determine / estimate concentration, load and impact - Advice on priority for wastewater treatment
4	Unacceptable water quality downstream	- Advice on mixing drainage and irrigation canal water - Advice on re-use of drain water - Advice on re-use of domestic waste water - Advice on source of drinking
5	Disposal of weeds	- Check safety aspects for workers during construction - Advice on avoiding contact

Stakeholder consultations and summary of the social assessment

Consultation workshops

One consultation has been carried for each of the above pilot areas with participation of WUA leaders and other local leaders in each scheme, and factory representatives in Khadrawiya, supplemented by more informal discussions during field visits. During the consultation meetings, small group discussions were used to allow participants to discuss their concerns and priorities, which were then presented during a plenary session. Participants stressed that improving canal water quality and improving solid waste disposal was a priority. Several communities had already made efforts to improve solid waste collection, but are limited by financial and technical constraints. Similarly, households and communities have tried to improve disposal of cesspit and septic tank outflows and septage, but lack financial and technical capacity to ensure safe disposal. Except near larger towns, the operators of carts or trucks that pump out cesspits and septic tanks also lack safe options for proper disposal of

septage. Some participants also expressed concern about, and a desire to prevent, groundwater contamination. The project will respond to problems that are felt to be local priorities, for which local people are ready and interested to work as partners in implementation. The views of the beneficiaries have been taken into consideration during the project design. Summary of the findings of the consultations, including participants, presentation of project activities and feedback of beneficiaries can be found in Annex 1 of this report. The following table shows the irrigated area and number of beneficiaries for each pilot area.

Beneficiary Information

	Nekla, Hamad Menesi	**Khadrawia**	**Al-Oqda and El-Teleen**
BCWUAs	4	TBC	TBC
Feddan of irrigated land	13,244	7,900	13,000
Total population	120,000	132,000	68,000

Institutions, rules and behavior as regards pollution in drains

WUA organization is based on hydraulic units of shared supply canals, and is therefore distinct from other local administrative jurisdictions and social groups. Under some previous projects and continuing in IIIMP, farmers at the mesqa (tertiary canal) level have been organized into groups sharing pumps and conveyance canals, which is replacing previous conditions where many farmers had private pumps. The groups are responsible for arranging water distribution and collecting charges from members and in general appear to be carrying out these tasks effectively. Within the mesqa-level WUAs, smaller groups of farmers share marwa (quaternary canals).

Branch Canal Water User Associations form a higher level of organization, with representatives from mesqa-level WUAs, domestic water users, and other water users if present. In Nekla, four BCWUAs have been established with support from IIMP, and have received training on BCWUA management. A district water board was established in 2009. In El Telen/El Okda, BCWUAs have been established with support from the Integrated Water Resources Management II Project. IWRM II concentrates on institutional development, aiming at building initial capacity from which BCWUAs can further develop according to local needs and initiatives. Beginning in April of this year, training was provided to women in BCWUAs, which included support for planning activities such as solid waste management.

As part of drainage projects, Collector User Organizations have been organized among farmers sharing the same drains. However, drainage groups have often been relatively inactive. Part of the current IIIMP project is to better integrate user involvement in drainage canal management into the larger framework of BCWUAs, district water boards and integrated water resources management districts.

Problems and opportunities for promoting local collective action to reduce pollution of drains can be analyzed using the institutional design principles developed by Elinor Ostrom. The design principles identify characteristics which can contribute to sustainable collective action

to manage local resources, and which therefore deserve careful consideration in considering the feasibility of developing local institutions for management of solid wastes and wastewater. In contrast to irrigation water, which is easily visible, pathogens and dangerous chemicals are invisible, and often threaten those downstream, meaning that there may be a greater need for pecialized technical expertise and involvement of higher levels of government, along with user-based activities.

Table. Institutional Design Principles: Some Implications for Local Management of Solid Wastes and Wastewater to Reduce Drainage Water Pollution

PRINCIPLES*	PROBLEMS	POSSIBLE SOLUTIONS
1. **Clear Boundaries** User groups and resource boundaries well-defined	• Mismatch of boundaries of irrigation, drainage, and administrative areas	• Specialized service areas for specific services: self-organization, "clustering"
2. Congruent rules a. Rules fit local conditions	• Legal framework and standardized models too general or inappropriate for local conditions	• Locally-customized rules, based on local knowledge
b. Rules link benefits to proportional sharing of costs	• Expectations for highly-subsidized services • Lack of local financial capacity • Costs of pollution externalized downstream	• Improve awareness of budget constraints • Cost-sharing mechanisms • User groups control fees • Targeted subsidies, e.g. for disposal in sanitary landfill
3. Collective choice Those affected by rules can participate in modifying rules	• Weak mechanisms for participation	• Develop WUA, BCWUA, and DWB structures • Local negotiation and agreement on new rules
4. **Accountable Monitoring** Monitors actively audit resource conditions and behavior; and are accountable to users	• Pathogens and heavy metals invisible • Users lack information on water quality • Treatment and monitoring require technical expertise	• Provide laboratory testing • Make water quality data publicly available • Technical support and auditing (inspection) • Community monitoring of improper disposal
5. Graduated Sanctions from warnings and mild sanctions, to severe	• BCWUAs lack formal authority to enforce rules and fees, legislative changes not likely soon	• Use local "social power" • Use authority of IWMDs and Local Units, e.g. for fee collection and backup enforcement
6. Low-cost conflict resolution Easy access to local arenas to settle conflicts	• Legal enforcement difficult	• Develop BCWUAs and DWBs as forums • Improve conflict resolution skills
7. Rights to organize acceptance or support for self-organized local initiatives	• Lack of suitable institutional arrangements for providing specialized local public goods	• Community-based initiatives accepted and supported by IWMDs and local government
8. Nested enterprises Multiple layers of organization	• Need to organize on multiple scales, e.g. of drainage canals	• Use multiple levels of WUAs and local government

Annex 1: Stakeholder consultations

Stakeholder meeting at Nekla pilot area

1. General

The Nekla pilot area is situated in the Mahmoudia district, in the upstream part of the Mahmoudia main canal in the Nile delta. The pilot area covers about 13,000 feddan in the command areas of the Hamad Menesi, Nekla, Ganabiet Hamad Menesi, Ganabiet Sharaf and Ganabiet El-Babli branch canals. Drainage is provided by the El-Atf main drain and El-Babli and Edko Sharaf secondary drains.

2. Stakeholder meeting

To introduce the project to the stakeholders and listen to their views and feedback, a stakeholder meeting was held on 13 June 2011. The meeting was attended by representatives of the IIIMP, EPADP, the Planning Sector of MWRI, ISSIP and WUA and BCWUA in the area. A list of the participants is given below.

Name	Job Title
Dr Tarek Kotb	Director of the IIIMP project
Eng. Ibrahim Mahmoud	Integrated Water resources District Quesna manager
Dr Magdi Assar	ISSIP II project
Dr Mohamed Ahmed	Planning Sector
WUA and BCWUA	Head and representatives
IIIMP regional office	Head and staff
Eng. Abd elshakour Mohamed	IIIMP consultant

2.1 Presentations

The meeting started with an introduction of each participant. This was followed by a short address from Dr Tarek Kotb the IIIMP director. Dr Tarek provided a brief description of the EWRMP and its objectives and activities. He also explained what the purpose of the meeting is and then started the discussions with the participants. The discussions focused on the following:

- What are the existing problems in the pilot area?
- How these problems can be solved?

The identified problems by the stakeholders were:

- Head-tail inequity in water supply
- Pollution of irrigation water by solid waste and untreated wastewater (due to lack of wastewater treatment and solid waste collection and disposal facilities)
- Lack of local support services for maintenance of improved irrigation assets
- Lack of coordination between various water resource management agencies

There was a general consensus that these problems cannot be solved by one entity or Ministry and that they need efforts from all stakeholders (i.e. governmental and non-governmental) to solve them. The BCWUA and WUA members offered to help by providing a piece of land for solid wastes treatment and asked if the project can provide equipment and training to help in this matter. Raising awareness between water users in the area was also discussed and found to be beneficial.

3. Conclusion

All concluded at the end that the EWRMP project can help in solving some of existing problems in the pilot area. This can be done in various ways such as complementing the activities of the IIIMP and ISSIP projects, providing equipments and training to BCWUA and WUA members and undertaking awareness campaigns.

Stakeholder meeting at El Khadrawia Pilot Area

1. General

Open drains are usually misused by many of the residents in villages as these drains cross these villages. Domestic sewage and evacuations of septic tanks are frequently dumped into open drains. In addition, industrial wastewater is discharged either untreated or inadequately treated to open drains. Household solid wastes are also discharged into open drains or along canal banks. Presently many open drains are carrying a mixture of agricultural drainage water, sewage, industrial wastewater, and debris of solid waste. Some of the re-use pumping stations have been stopped because of the deterioration of their water quality as result of these external pollution sources. The industrial waste is disposing wastes from a factory in the Mubarak industrial area. The sewage wastes being disposed into the drain originate from the police camp located near the mubarak industrial area. El Khadrawia drain receives municipal

wastewater from the administrative districts (Markaz) surrounding the course of the drain, Qwesna and Zefta

2. Stakeholder meeting

To increase the information about the problem and discuss it with stakeholders, a small workshop was held in Mubarak industrial city at Wednesday, 8 June 2011. A list of the participants is given below.

Name	Job Title
Hesham Salah	Drainage Engineer " Integrated Water resources District Quesna"
Abd Al mohsen EL hoseeny Ibrahim	Integrated Water resources District Quesna manager
Hesham Mohamed Amin	Egypt Foods Company
Ashraf Mohamed Al hasannen	Ground water sector ministry of water resources and irrigation
Mohamed Abo Talab Al Gohary	Ground water sector ministry of water resources and irrigation
Abd Al Fatah Amin Abd Al motey	Head of Water user association " Tala Canal"
Mohamed Khalad Abdo Mansor	Head of Water user association " Al laymon Canal"
Emad Al Din Ali Afify	Islamic Group For Paper Company
Mohsen Shafaai Omar	Water quality unit - Plannig Sector
Mohamed AL Zamaly	Leather factory
Mohamed Mahmoud Al sawy	General manager for Mubarak industrial City

Hassan Al Banaa Abd Al Reheem	Egyptian Exportation Center
Ibrahim Mohamed Farag Allah	Environmental Responsible "Mubarak Industrial City"
Tharwat Mosa Hagazy	Quesna City Board
Mohamed Farouk Nabawi	Water User Association
Ahmed Ibrahim Rohaeem	Integrated Water resources District Quesna
Soliman Saad Garges	Integrated Water resources District Quesna
Ihab Ahmed Salah Azmei	Meno Bardi Company
Mohamed Mahmoud EL saed Mostafa	Drinking water authority
Mammdoh Abd Al samea Abd Alsalam	Ground Water Institute
Hussien Abd Ahaleem Al Gamal	Planning Sector - Ministry of water resources and irrigation
Ali said Mohamed	Egyptian Public Authority For Drainage Projects "Environmental Unit"
Mohamed Hussien Amin	Egyptian Public Authority For Drainage Projects "Environmental Unit"
Emad Mohamed Mahmoud	Egyptian Public Authority For Drainage Projects "Environmental Unit"

2.1 Presentations

In the beginning, Mr. Ibrahim Mahmoud Elaraby (the owner of TOSHIBA Company) welcomed the guests and discussed that there is a treatment plant under construction, however the design currently being built would not be sufficient to treat the industrial wastewater. Eng.

Mohamed Hussein Amin (EPADP Environmental Unit) introduces the problem and suggest to divide the participants into a four groups to answer a two question:

- What is the problem from your opinion?
- What is your suggestion to solve the problem?

All of participants were agreed that the problem is there is no system for treatment the wastewater and there is no other way available now except to dump the wastewater into the open drain Eng. Abd Elmohsen (Director of Quesna Discrete) and others suggested the following solutions:

1. Establish an in-stream wetland in El Khadrawia drain
2. Install a wire fence on both sides of EKD around Bridge Km 23.35
3. More frequent (4 times/year) dredging of deposits within 1 km downstream from Bridge Km 23

Ibrahim Mohamed Farag Allah (Environmental Responsible Mubarak Industrial City) and others suggested that:

1. Conduct environmental awareness campaigns for village residents
2. Conduct environmental awareness campaigns for farmers
3. Increase environmental awareness among plant managers in Mubarak city
4. Strengthen completing the wastewater collection and treatment project in Mubarak City

Stakeholders expressed strong interest in reducing pollution of drains from solid and liquid waste, including agricultural wastes, and the willingness of BCWUAs and WUAs to take an active role in such efforts.

Conclusion

- Mubarak Industrial Zone should complete the treatment station, and follow up visits should be made to monitor and push the responsible staff of the station until the implementation.
- Establishing water treatment station on Khadrawia drain near the discharge pipe.
- Establishing a treatment station before raising water into the Abbasy canal.
- Cooperating with the major factories in the area as partners with MWRI in the projects of water quality improvement and environmental improvement and advertising this partnership in the various means of communication.
- Making awareness campaigns for all levels.
- Prioritizing the execution of sewage projects in the villages of Khadrawia area, whether they were high or low cost stations.
- Activating laws to maintain water quality.
- Proposing to establish a union to preserve environment and water quality in the area that combines representatives of the industrial zone and members of water users' associations, MWRI and Menofia governorate.

- Training the engineers of EPADP to monitor water quality and select the observation grid points to equip them with the required tools.
- Caring for the general hygiene of the citizens of the area and establishing hospitals.

Stakeholder meeting at El Okda &E-Tellen Pilot Area

1. General

In the absence of well-functioning collection and management systems for solid wastes and wastewater in the villages,open drains are usually misused by many of the residents in villages as these drains cross these villages. Domestic sewage and evacuations of septic tanks are frequently dumped into open drains. Household solid wastes are also occasionally discharged into open drains. Presently many open drains are carrying a mixture of agricultural drainage water, sewage, industrial wastewater, and debris of solid waste. Some of the re-use pumping stations have been stopped because of the deterioration of their water quality as result of these external pollution sources.

El Okda & Tellen drains are represent the above problem where it receives municipal wastewater from the Hod eltarfa , Talmosmar , Abotooala and Tellen villages.

2. Stakeholder meeting

To increase the information about the problem and discuss it with stakeholders, a small workshop was held in mayor house at Tuesday, 16 Aug. 2011. Participants included village mayors, WUA leaders, teachers, and officials from the water management district**.** A list of the participants is given below.

Name	Job Title
Hassan Khatab Saleem	Local Authority Manager
Mohamed Goda Abd Alhameed	Development responsible " Local authority"
Samir Mohamed Abass	Drainage Engineer " South Sharkiya Directorate"
Mahmoud Mohamed Salama	District Engineer " Mena EL kamh"
Mohamed Ramzy sabry	Tal Mosmar Village mayor

Name	Job Title
Abd Allah Hassan	Agriculture Association manager
Mohamed Hassan EL sayed Morgan	Environment responsible " Local authority"
Ateya Ateya Abraham	Environment responsible " Local authority"
Emad shawky El shanwany	Farmer
Salma Hamad Mohamed	Agriculture Engineer
Ahmed Said Hasham	Farmer
Ahmed Abeed salam	Engineering Department " Local authority"
Abd El Fatah Abd El Manam Khatab	Agriculture Engineer
saleem Mohamed Mohamed Sokar	Farmer
EL saed Abd Al Fatah Eisa	teacher
Asam Abd El mageed Makey	Farmer
khaery Abd Al hady Hamad	Dupty manager "EL telen Bank"
Al saed Mostafa Shawareb	Head of Water User association " EL seteny El Gadeed"
Mohamed Mahmoud EL saed Mostafa	Drinking water authority

Name	Job Title
Mammdoh Abd Al samea Abd Alsalam	Ground Water Institue
Hussien Abd Ahaleem Al Gamal	Planning Sector - Ministry of water resources and irregation
Fawazy Abd Al Rahman	Drainage Engineer " South Sharkiya Dirctorate"
Mahar Awad El saed	Drainage Engineer " South Sharkiya Dirctorate"
Ali said Mohamed	Egyptain Public Authority For Drainage Projects "Environmntal Unit"
Mohamed Hussien Amin	Egyptain Public Authority For Drainage Projects "Environmntal Unit"
Emad Mohamed Mahmoud	Egyptain Public Authority For Drainage Projects "Environmntal Unit"
Adel Ahmed Al saed	Farmer

2.1 Presentations

- In the beginning, Mr. Mohamed Ramzy Sabr (the mayor of Tal Mosmar Village) welcomed the guests and said that he hope to cooperation with all participants in solving all the problems of liquid and solid wastes in the area .
- Eng. Ali Said Mohammed (from EPADP Environmental Unit) introduces the problem and suggests dividing the participants into a four groups to answer a two question:

- What is the problem from your opinion?
- What is your suggestion to solve the problem?

- All of participants were agreed that the problem is there is no system for treatment the west water and there is no other way to dispose of the wastewater and solid waste besides the open drains

- Eng. Mahar Awad El saed (Drainage Engineer " South Sharkiya Directorate") and others suggested the following solutions :

1. Establish an in-stream wetland in El Okda drain
2. Establish an low cost treatment plant in El Tellen drain
3. More frequent (4 times/year) dredging of deposits in both El Okda drain and El Tellen drain
4. .

- Mohamed Hassan El Sayed Morgan (Environment responsible “Local authority) and others suggested establish a system for collection and recycle the solid waste in all area
- Khaery Abd Al Hady Hamad (Deputy Manager "El Telen Bank") and others suggested that :

1. Conduct environmental awareness campaigns for village residents
2. Conduct environmental awareness campaigns for farmers

Participants said that they strongly supported wastewater treatment and local solid waste collection. One village had tried to start its own wastewater treatment project, and had a site and had started construction, but had been unable to continue due to lack of funds. Two villages had installed pipes, which take septic tank effluent to drains, but did not have the resources to do any kind of treatment. They said they were willing to share investment costs, e.g. 50%. Participants also suggested covering drains in village areas, awareness campaigns, solid waste recycling, treating polluted wells and groundwater, dealing with pesticide dangers, and requested data on groundwater quality.

Conclusion

- Execution a waste water treatment station on Eltellen & Okda area is necessary
- A system of collection and recycling the solid waste will improve the water quality and environment in the area
- Making awareness campaigns for all levels is required.
- Activating laws to maintain water quality.
- Training the engineers of EPADP to monitor water quality and select the observation grid points to equip them with the required tools.

Annex 2: World Bank EHS Guidelines in relation to SWM

General Waste Management

The following guidance applies to the management of nonhazardous and hazardous waste. Additional guidance specifically applicable to hazardous wastes is presented below. Waste management should be addressed through a Waste management system that addresses issues linked to waste minimization, generation, transport, disposal, and monitoring

Waste Management Planning

Facilities that generate waste should characterize their waste according to composition, source, types of wastes produced, generation rates, or according to local regulatory requirements. Effective planning and implementation of waste management strategies should include:

- Review of new waste sources during planning, sitting, and design activities, including during equipment modifications and process alterations, to identify expected waste generation, pollution prevention opportunities, and necessary treatment, storage, and disposal infrastructure
- Collection of data and information about the process and waste streams in existing facilities, including characterization of waste streams by type, quantities, and potential use/disposition
- Establishment of priorities based on a risk analysis that takes into account the potential EHS risks during the waste cycle and the availability of infrastructure to manage the waste in an environmentally sound manner
- Definition of opportunities for source reduction, as well as reuse and recycling
- Definition of procedures and operational controls for onsite storage
- Definition of options / procedures / operational controls for treatment and final disposal

Waste Prevention

Processes should be designed and operated to prevent, or minimize, the quantities of wastes generated and hazards associated with the wastes generated in accordance with the following strategy:

- Substituting raw materials or inputs with less hazardous or toxic materials, or with those where processing generates lower waste volumes
- Applying manufacturing process that convert materials efficiently, providing higher product output yields, including modification of design of the production process, operating conditions, and process controls
- Instituting good housekeeping and operating practices, including inventory control to reduce the amount of waste resulting from materials that are out-of-date, off specification, contaminated, damaged, or excess to plant needs

- Instituting procurement measures that recognize opportunities to return usable materials such as containers and which prevents the over ordering of materials
- Minimizing hazardous waste generation by implementing stringent waste segregation to prevent the commingling of non-hazardous and hazardous waste to be managed

Recycling and Reuse

In addition to the implementation of waste prevention strategies, the total amount of waste may be significantly reduced through the implementation of recycling plans, which should consider the following elements:

- Evaluation of waste production processes and identification of potentially recyclable materials Identification and recycling of products that can be reintroduced into the manufacturing process or industry activity at the site
- Investigation of external markets for recycling by other industrial processing operations located in the neighborhood or region of the facility (e.g., waste exchange)
- Establishing recycling objectives and formal tracking of waste generation and recycling rates
- Providing training and incentives to employees in order to meet objectives

Treatment and Disposal

If waste materials are still generated after the implementation of feasible waste prevention, reduction, reuse, recovery and recycling measures, waste materials should be treated and disposed of and all measures should be taken to avoid potential impacts to human health and the environment. Selected management approaches should be consistent with the characteristics of the waste and local regulations, and may include one or more of the following:

- On-site or off-site biological, chemical, or physical treatment of the waste material to render it nonhazardous prior to final disposal
- Treatment or disposal at permitted facilities specially designed to receive the waste. Examples include: composting operations for organic non-hazardous wastes; properly designed, permitted and operated landfills or incinerators designed for the respective type of waste; or other methods known to be effective in the safe, final disposal of waste materials such as bioremediation.

Hazardous Waste Management

Hazardous wastes should always be segregated from nonhazardous wastes. If generation of hazardous waste cannot be prevented through the implementation of the above general waste management practices, its management should focus on the prevention of harm to health, safety, and the environment, according to the following additional principles:

- Understanding potential impacts and risks associated with the management of any generated hazardous

- waste during its complete life cycle
- Ensuring that contractors handling, treating, and disposing of hazardous waste are reputable and legitimate enterprises, licensed by the relevant regulatory agencies and following good international industry practice for the waste being handled
- Ensuring compliance with applicable local and international regulations 51

Waste Storage

Hazardous waste should be stored so as to prevent or control accidental releases to air, soil, and water resources in area location where:

- Waste is stored in a manner that prevents the commingling or contact between incompatible wastes, and allows for inspection between containers to monitor leaks or spills. Examples include sufficient space between incompatibles or physical separation such as walls or containment curbs
- Store in closed containers away from direct sunlight, wind and rain
- Secondary containment systems should be constructed with materials appropriate for the wastes being contained and adequate to prevent loss to the environment
- Secondary containment is included wherever liquid wastes are stored in volumes greater than 220 liters. The available volume of secondary containment should be at least 110 percent of the largest storage container, or 25 percent of the total storage capacity (whichever is greater), in that specific location
- Provide adequate ventilation where volatile wastes are stored.

Hazardous waste storage activities should also be subject to special management actions, conducted by employees who have received specific training in handling and storage of hazardous wastes:

- Provision of readily available information on chemical compatibility to employees, including labeling each container to identify its contents
- Limiting access to hazardous waste storage areas to employees who have received proper training
- Clearly identifying (label) and demarcating the area, including documentation of its location on a facility map or site plan
- Conducting periodic inspections of waste storage areas and documenting the findings
- Preparing and implementing spill response and emergency plans to address their accidental release.
- Avoiding underground storage tanks and underground piping of hazardous waste

Transportation

On-site and Off-site transportation of waste should be conducted so as to prevent or minimize spills, releases, and exposures to employees and the public. All waste containers designated for off-site shipment should be secured and labeled with the contents and associated hazards,

be properly loaded on the transport vehicles before leaving the site, and be accompanied by a shipping paper (i.e., manifest) that describes the load and its associated hazards, consistent with the guidance provided in Section 3.4 on the Transport of Hazardous Materials.

Treatment and Disposal

In addition to the recommendations for treatment and disposal applicable to general wastes, the following issues specific to hazardous wastes should be considered:

Commercial or Government Waste Contractors:

In the absence of qualified, commercial or government-owned waste vendors (taking into consideration proximity and transportation requirements), facilities generating waste should consider using:

- Have the technical capability to manage the waste in a manner that reduces immediate and future impact to the environment
- Have all required permits, certifications, and approvals, of applicable government authorities
- Have been secured through the use of formal procurement agreements In the absence of qualified commercial or government-owned waste disposal operators (taking into consideration proximity and transportation requirements), project sponsors should consider using:

    - Installing on-site waste treatment or recycling processes
    - As a final option, constructing facilities that will provide for the environmental sound long-term storage of wastes on-site (as described elsewhere in the General EHS Guidelines) or at an alternative appropriate location up until external commercial options become available

Small Quantities of Hazardous Waste:

Hazardous waste materials are frequently generated in small quantities by many projects through a variety of activities such as equipment and building maintenance activities. Examples of these types of wastes include: spent solvents and oily rags, empty paint cans, chemical containers; used lubricating oil; used batteries (such as nickel-cadmium or lead acid); and lighting equipment, such as lamps or lamp ballasts. These wastes should be managed following the guidance provided in the above sections.

Monitoring

Monitoring activities associated with the management of hazardous and non-hazardous waste should include:

- Regular visual inspection of all waste storage collection and storage areas for evidence of accidental releases and to verify that wastes are properly labeled and stored. When significant quantities of hazardous wastes are generated and stored on site, monitoring activities should include:

    - o Inspection of vessels for leaks, drips or other indications of loss
    - o Identification of cracks, corrosion, or damage to tanks, protective equipment, or floors
    - o Verification of locks, emergency valves, and other safety devices for easy operation (lubricating if required and employing the practice of keeping locks and safety equipment in standby position when the area is not occupied)
    - o Checking the operability of emergency systems
    - o Documenting results of testing for integrity, emissions, or monitoring stations (air, soil vapor, or groundwater)
    - o Documenting any changes to the storage facility, and any significant changes in the quantity of materials in storage

- Regular audits of waste segregation and collection practices
  Tracking of waste generation trends by type and amount of waste generated, preferably by facility departments
- Characterizing waste at the beginning of generation of a new waste stream, and periodically documenting the characteristics and proper management of the waste, especially hazardous wastes
- Keeping manifests or other records that document the amount of waste generated and its destination
- Periodic auditing of third party treatment and disposal services including re-use and recycling facilities when significant quantities of hazardous wastes are managed by third parties. Whenever possible, audits should include site visits to the treatment storage and disposal location
- Regular monitoring of groundwater quality in cases of Hazardous Waste on site storage and/or pretreatment and disposal
- Monitoring records for hazardous waste collected, stored, or shipped should include:

    - o Name and identification number of the material(s) composing the hazardous waste
    - o Physical state (i.e., solid, liquid, gaseous or a combination of one, or more, of these)
    - o Quantity (e.g., kilograms or liters, number of containers)
    - o Waste shipment tracking documentation to include, quantity and type, date dispatched, date transported and date received, record of the originator, the receiver and the transporter
    - o Method and date of storing, repacking, treating, or disposing at the facility, cross-referenced to specific manifest document numbers applicable to the hazardous waste
    - o Location of each hazardous waste within the facility, and the quantity at each location.

Annex 3: Draft Table of Contents of the TOR for the Pilot-specific EAs/EMPs

CONTENTS of the TOR:

1. Background (Project Concept and Rationale)
2. Pilot Objectives
3. Pilot Area (location and characteristics)
4. Pilot Activities
5. Environmental Assessment - Objective and Requirements
6. General Scope of Work of Consultancy Services
7. Inputs/data to be provided by the Government
8. Stakeholder Consultation and Public Disclosure
9. EA Team, Reporting and Schedule of Payments

APPENDICES:

1. Outline of EA/EMP Report
2. Preparation and Implementation of EMP
3. Standard Form of Contract Consultants' Services Lump–Sum Remuneration

APPENDIX 1: OUTLINE OF EA/EMP REPORT[1]

***Executive summary*.** Concisely discusses significant findings and recommended actions.
***Policy, legal, and administrative framework*.** Discusses the policy, legal, and administrative framework within which the EA is carried out. Explains the environmental requirements of any co-financiers. Identifies relevant international environmental agreements to which the country is a party. Analyses the (a) national framework and (b) sector framework.

***Project (Pilot site) description*.** Concisely describes the proposed project and its geographic, ecological, social, and temporal context, including any offsite investments that may be required. Indicates the need for any resettlement plan or indigenous peoples development plan. Includes a map showing the project site and the Project's area of influence.

***Baseline data*.** Assesses the dimensions of the study area and describes relevant physical, biological, and socioeconomic conditions, including any changes anticipated before the project commences. Also takes into account current and proposed development activities within the project area but not directly connected to the project. Data should be relevant to decisions about project location, design, operation, or mitigation measures. The section indicates the accuracy, reliability, and sources of the data.

***Environmental impacts*.** Predicts and assesses the project's likely positive and negative impacts, in quantitative terms to the extent possible. Identifies mitigation measures and any residual negative impacts that cannot be mitigated. Explores opportunities for environmental enhancement. Identifies and estimates the extent and quality of available data, key data gaps,

[1] *Environmental Assessment Sourcebook Volume 1 Policies, Procedures, and Cross - Sectoral; Issues. The World Bank*

and uncertainties associated with predictions, and specifies topics that do not require further attention.

***Analysis of alternatives*.** Compares feasible alternatives to the proposed project site, technology, design, and operation - including the "without project" situation. The comparison will be made in terms of their potential environmental impacts; the feasibility of mitigating these impacts; their capital and recurrent costs; their suitability under local conditions; and their institutional, training, and monitoring requirements.

Environnemental Management Plan (EMP). The EMP should cover: summary of impacts, description of mitigation measures, description of monitoring program, legal requirements, institutional arrangements, implementation schedule, reporting, equipment, cost estimates. The development of mitigation measures, including a training plan, monitoring, institutional arrangements and scheduling should be aided by the use of matrices.

Pest Management. Pest and pesticides management issues relevant to the project area addressed in the EA. Preparation of a specific Pest Management Plan (PMP), in accordance with BP 4.01 Annex C, is required when there are significant pest management issues.

Appendices (supporting docs, e.g. PMP; record of public consultation; list of reference).

Appendix 2 to Annex 3: PREPARATION AND IMPLEMENTATION OF PILOT-SPECIFIC EMP

As part of an EA report, EMPs provide a critical link between measures to mitigate adverse impacts and the integration of such measures during the implementation and operation of projects. They summarize the anticipated environmental impacts of projects and provide details on the measures, responsibilities and scheduling to mitigate these impacts, costs of mitigation and monitoring and supervision. The Project Appraisal Document (PAD) summarizes the main measures contained in the EMP, including environment-related loan or grant conditionalities and covenants and the program and budget for environmental supervision. Mitigation measures in the EMP will be translated into the project implementation/operation manual and financing agreements. During project implementation, the borrower reports on compliance with environmental commitments, the status of mitigating measures and the results of monitoring programs as specified in the project documents.

Content of an EMP

- Summary of impacts: Predicted adverse environmental impacts and their relationship to social impacts (and any uncertainties about their effects) for which mitigation is necessary should be identified and summarized.

- Description of mitigation measures: Each measure should be briefly described in relation to the impact(s) and conditions under which it is required. These should be accompanied by, or referenced to, designs, development activities (including equipment

descriptions) and operating procedures and implementation responsibilities. Public consultation should be clearly described and justified.

- Description of monitoring program: The EMP identifies monitoring objectives and specifies the type of monitoring required; it also describes environmental performance indicators which provide linkages between impacts and mitigation measures identified in the EA report - parameters to be measured, methods to be used, sampling location and frequency of measurements, detection limits (as appropriate) and definition of thresholds to signal the need for corrective actions. Monitoring and supervision arrangements should be agreed by the Bank and the borrower to: ensure timely detection of conditions requiring remedial measures in keeping with good practice; furnish information and the progress and results of mitigation and institutional strengthening measures; and, assess compliance with national and Bank safeguard policies. Such arrangements should be clearly specified in the project implementation/operations manual to reinforce project supervision.

- Legal requirements and bidding and contract documents: The incorporation of detailed mitigation, monitoring and supervision arrangements into legal conditions and covenants is essential. It is good practice to ensure that implementation of major environmental requirements is linked to disbursement conditions. It is important to translate EMP requirements into bidding and contract documents to ensure that obligations are clearly communicated to contractors.

- Institutional arrangements: Responsibilities for mitigation and monitoring should be defined along with arrangements for information flow, especially for coordination between agencies responsible for mitigation. This is especially important for projects requiring cross-sectoral integration. In particular, the EMP specifies who is responsible for undertaking the mitigating and monitoring measures, e.g., for enforcement of remedial actions, monitoring of implementation, training, financing, and reporting. Institutional arrangements should also be crafted to maintain support for agreed enforcement measures for environmental protection. Where necessary, the EMP should propose strengthening the relevant agencies through such actions as: establishment of appropriate organizational arrangements; appointment of key staff and consultants; and, arrangements for counterpart funding and on-lending.

- Implementation schedule: The timing, frequency and duration of mitigation measures and monitoring should be included in an implementation schedule, showing phasing and coordination with procedures in the overall project implementation /operations manual. Linkages should be specified where implementation of mitigation measures is tied to institutional strengthening and to the project legal agreements, e.g. as conditions for loan effectiveness or disbursement.

- Reporting: Procedures for providing information on the progress and results of mitigation and monitoring measures should also be clearly stated. Recipients of such information should include those with responsibility for ensuring timely implementation

of mitigation measures and for undertaking remedial actions. In addition, the structure, content and timing of reporting to the Bank should be designed to facilitate supervision and the Task Manager should establish arrangements for the timely receipt of monitoring reports and their forwarding to the Bank's environment specialists for review and comment.

- Cost estimates: These should be specified for both the initial investment and recurring expenses for implementing all measures defined in the EMP, integrated into the total project costs and factored into financing negotiations. As mitigating costs may occur at points during project implementation or operations, indications of cash flow should be provided. It is important to capture all costs – including administrative, design and consultancy, and operational and maintenance costs – resulting from meeting required standards or modifying project design.

ENVIRONMENTAL MANAGEMENT PLAN

A Mitigation (Three Phases)

Project Activity	**Potential Environmental Impacts**	**Proposed Mitigation Measures**	**Institutional Responsibilities** (incl. enforcement & coordination**)**	**Cost Estimates**	**Comments** (e.g. secondary impacts**)**
Pre-Construction Phase					
Construction Phase					
Operation and Maintenance Phase					

B Monitoring (Three Phases)

Proposed Mitigation Measure	**Parameters to be monitored**	**Location**	**Measurements** (Incl. methods & equipment)	**Frequency of Measurement**	**Responsibilities** (Incl. review and reporting)	**Cost** (equipment & individuals)
Pre-Construction Phase						
Construction Phase						
O/M Phase						

Total Cost						

(a) C Institutional Strengthening and Training for EMP Implementation

Institutional Strengthening Activity	**Position(s)**	**Scheduling**	**Responsibilities**	**(b) Cost Estimates**	
(c) Activities					
Training Activity	**(d) Participants**	**Types of Training**	**Content** (modules, etc.)	**(e) Scheduling**	**(f) Cost Estimates**

Table 1 Example Mitigation Plan for a drainage project

Issue	Mitigating Measure	Responsibility	Time or Cost Requirements
Land and Soil Resources			
4 hectares of non-contiguous waterlogged lands utilized by nomadic herders will be converted to cropland	Herders will be allowed access to bunds and intervening non-cropped areas for grazing; these areas will be allowed to grow up in suitable forage crops	Irrigation and Drainage Management Agency	Minimal except for possible periodic inspection to ensure that herders are granted free access and occasional conflict resolution
Water Resources/Water Quality			
Discharge from continuous tubewell pumping of saline aquifer will raise salinity levels in the river to excessive heights according to modeling exercises	Tubewell pumping will be discontinuous and staggered along the river such that the saline discharge will be sufficiently diluted. Pumping rates and salinity of discharge and the river at strategic locations will be monitored to verify model predictions. The pumping will be continuously refined to balance water table reduction with river water quality requirements.	Irrigation and Drainage Management Agency	Dedicated staff of 8 full time for first three years of project; to be re-evaluated at end of study period. May require initial support of international consultant, cost to be determined
Wetlands and Other Habitats			
Degraded saline wetland will be lost	Evaporation ponds will exceed wetland in area and are predicted to develop similar vegetation community within 3 years	Irrigation and Drainage Management Agency	No additional cost
Health			
Schistosomiasis and other parasites	Parasite monitoring for workers and residents	Ministry of Health	To be determined

Issue	Mitigating Measure	Responsibility	Time or Cost Requirements
Cultural Heritage			
Drainage canals will need to cross an area suspected to contain significant archaeological resources	Personnel from the Ministry of Antiquities will monitor the canal excavation work and will have the authority to halt construction if and when any archaeological resources are encountered	Irrigation and Drainage Management Agency and Ministry of Antiquities	To be determined

Table 2 General Monitoring program (as part of the EMP) for a drainage project

Item	Monitoring Parameters:	Sampling Frequency:	Monitoring Locations:
Baseline			
A baseline monitoring program may be required if existing data is insufficient for decision making; such a program may be more rigorous than the operations monitoring program. The baseline program should collect water balance data (surface and groundwater flow rates, evapotranspiration rates, infiltration, etc.) and water quality data.			
Operations Phase			
Ground Water Quality	PH Salinity Alkalinity Conductivity Ammonia Total nitrates Phosphorous Herbicide and pesticide scans BOD COD	Monthly	Tube wells, tile drain outfalls, and/or monitoring wells

Surface Water Quality-Receiving Waters[1]	PH Salinity Alkalinity Conductivity Ammonia Total nitrates Phosphorous Herbicide and pesticide scans BOD COD Coliforms	Weekly	Above and below project influence and at strategic stations above and below drainage outfalls, at minimum every 500 meters; if the river exceeds 3 meters depth, samples at all stations should be at surface and at 60-80% of depth.
Drainage Quality[1]	PH Salinity Alkalinity Conductivity Ammonia Total nitrates Phosphorous Herbicide and pesticide scans BOD COD Coliforms	Weekly	At point of discharge

[1] If there are known or suspected discharges of municipal or industrial wastewater, then the full suite of parameters in The World Bank's *General Environmental Guidelines*, provided in *Annex III*, should be monitored.

Appendix 2 to Annex 3: Standard Form of Contract Consultants' Services Lump–Sum Remuneration.

Annex 4: Water quality issues that can be addressed by GEF-EWRMP

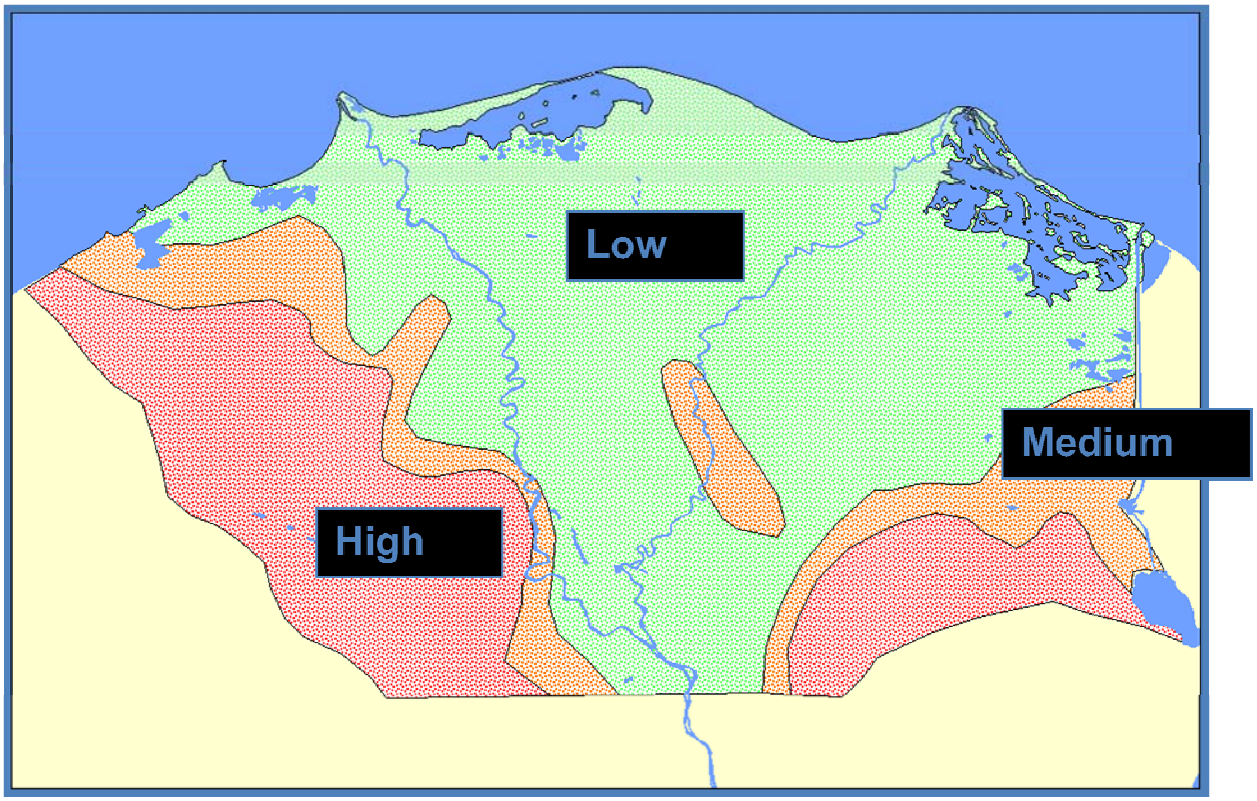


Figure A1: Groundwater vulnerability to pollution from unmanaged drainage reuse

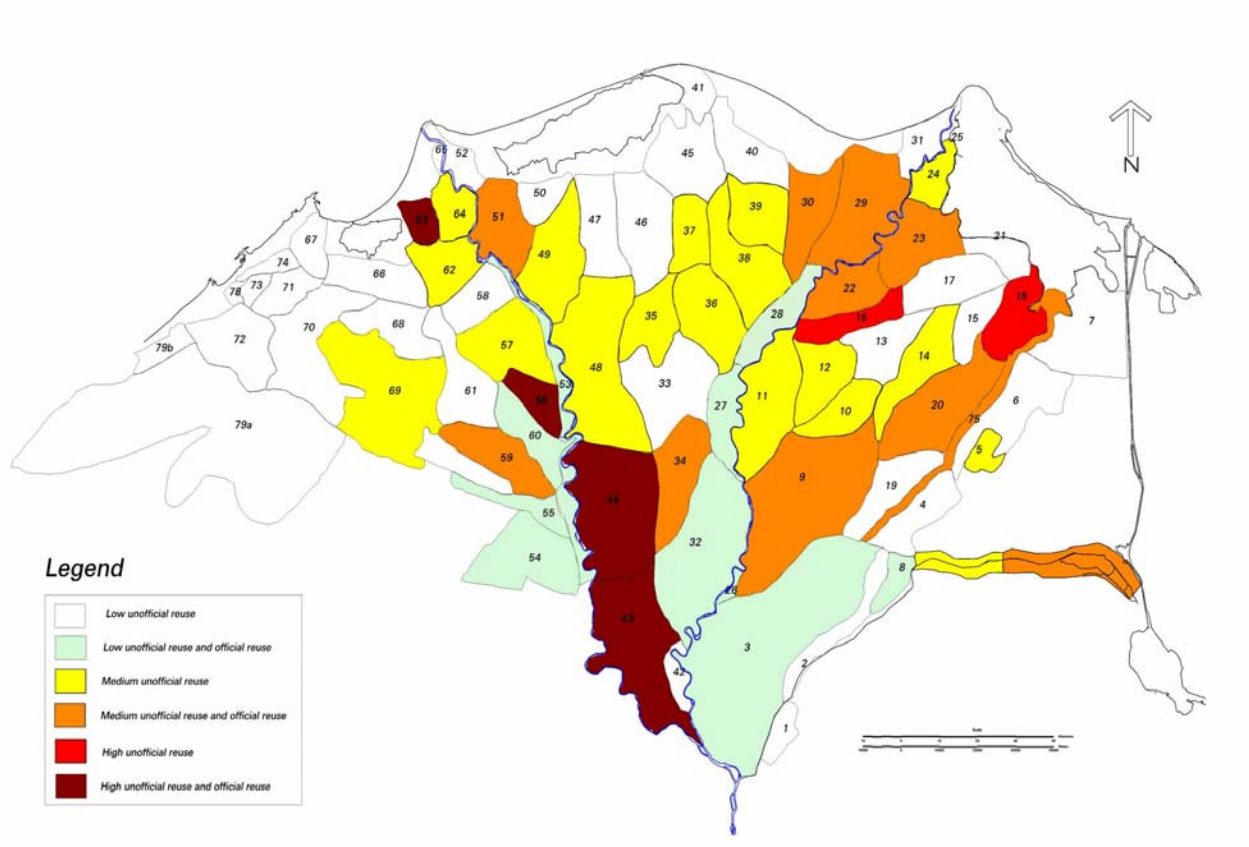


Figure A2: Official and unofficial reuse of agricultural drainage

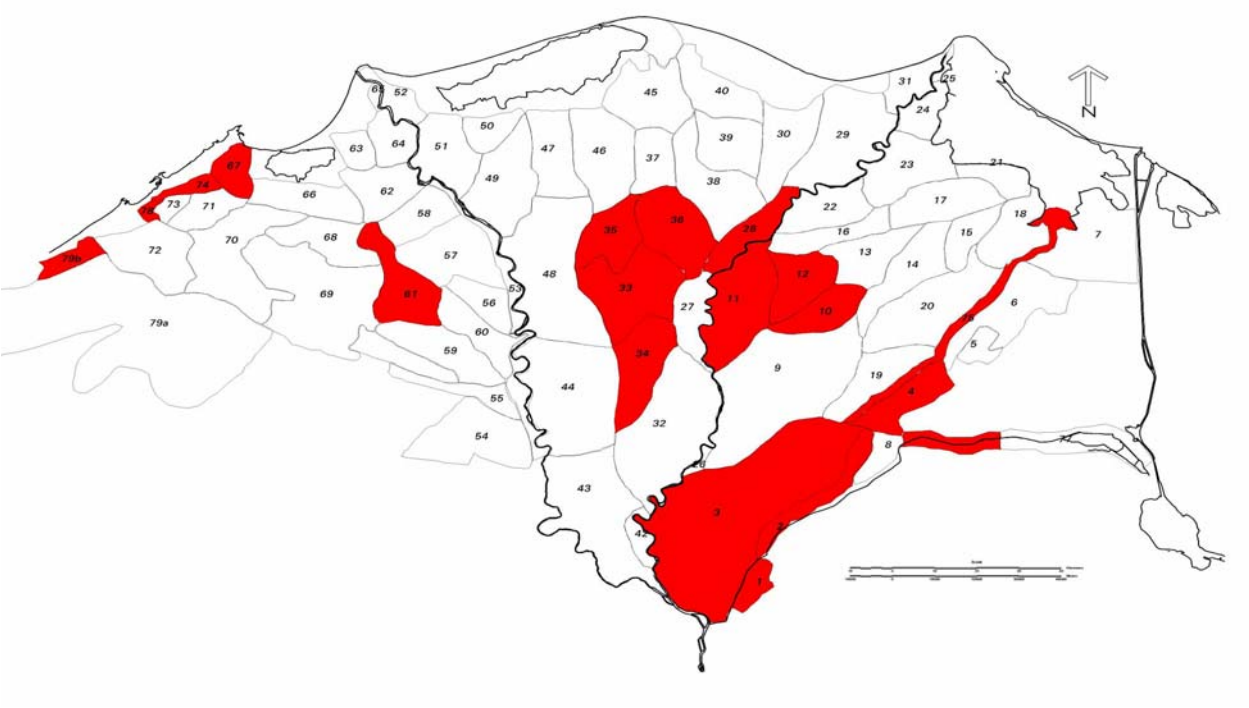


Figure A3: Hot spots of health exposure to water pollution

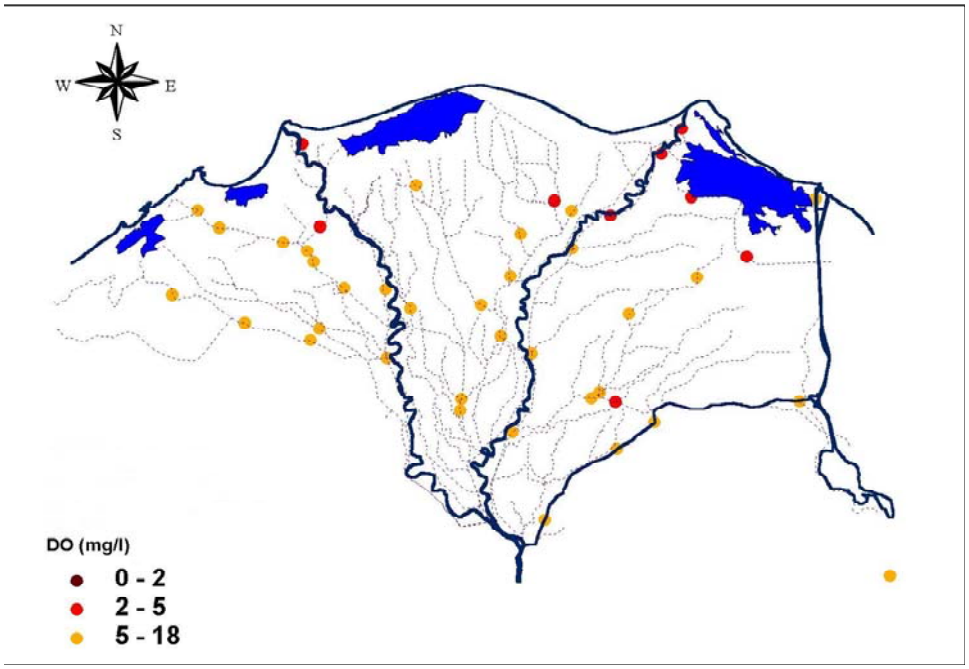


Figure A4: Too low Dissolved Oxygen in IIIMP Mahmoudia command close to Lake Edku