



LIFE Integrated Water Resources Management
Task Order No. 802
EPIQ II: Contract No. EPP-T-802-03-00013-00

**TASK 4: IMPROVED MAINTENANCE AND UPGRADING OF WATER
MANAGEMENT EQUIPMENT:**

***Assessment of Egyptian Farmers' Need for Improved
Maintenance of Irrigation Equipment and Training to Manage
Water Users' Associations***

Report No. 9

August 2005



International Resources Group
In association with EPIQ II Consortium



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Abbreviations and Acronyms

AAU	Agricultural Administrative Unit
AED	Academy for Educational Development (a US-based entity providing USAID-funded assistance regarding environmental education and awareness)
APRP	Agricultural Policy Reform Program
BCWUA	Branch Canal Water User Association
CD	Central Directorate
CDA	Community Development Association
CTO	Cognizant Technical Officer. The USAID person responsible for supervising a technical assistance contractor
CY	Calendar Year
DAI	Development Alternatives, Inc. (a Washington DC-based consulting firm working with IRG to implement the project)
EEAA	Egyptian Environmental Affairs Agency
EEPP	Egyptian Environmental Policy Program (a USAID-funded program aimed at achieving environmental policy reform)
EPADP	(MWRI) Egyptian Public Authority for Drainage Projects
EPIQ	Environmental Policy and Institutional Strengthening Indefinite Quantity Contract
ET	Evapotranspiration
GIS	Geographic Information System
GOE	Government of Egypt
GPS	Global Positioning System
GW	Groundwater
GWS	Groundwater Sector
HD	(Aswan) High Dam
IAS	Irrigation Advisory Service
IBRD	International Bank for Reconstruction and Development or World Bank
ID	Irrigation Department
IDS	Irrigation and drainage system
IIIMP	Integrated Irrigation Improvement and Management Project
IIP	Irrigation Improvement Project
IRG	International Resources Group (a Washington DC-based consulting firm that is prime contractor for the IWRMP)
IRU	MWRI Institutional Reform Unit
IRs	Intermediate Results
IS	Irrigation Sector of the MWRI
IT	Information Technology
IWMD	Integrated Water Management District
IWMU	MWRI Integrated Water Management Unit
IWRM	Integrated Water Resources Management
IWRMP	Integrated Water Resource Management Project
LAN	Local Area Network
LIFE	Livelihood and Income from the Environment (project)
LOE	Level of Effort
M&E	Monitoring and Evaluation

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MALR	Ministry of Agriculture and Land Reclamation
MED	MWRI Mechanical & Electrical Department
MIC	MWRI Ministry Information Center
MISD	Matching Irrigation Supply and Demand
MOE	Ministry of Education
MOH	Ministry of Housing
MOU	Memorandum of Understanding
MSEA	Ministry of State for Environmental Affairs
MWRI	Ministry of Water Resources and Irrigation
NGO	Non governmental Organization
NWRC	(MWRI) National Water Research Center
O&M	Operation and Maintenance
OJT	On-the-Job Training
PM&E	Performance Monitoring and Evaluation
RSC/WP	Red Sea Coastal/Water Project, short name for USAID Red Sea Coastal and Improved Water Resource Management Project
RWP	Relative Water Supply
SIRs	Sub-Intermediate Results
SOs	Strategic Objectives
STTA	Short-term Technical Assistance
TA	Technical assistance
TOR	Terms of reference
USAID	United States Agency for International Development
WCU	MWRI Water Communication Unit
WDC	MWRI Central Water Distribution Center
WPRP	Water Resources Results Package
WQU	MWRI Water Quality Unit
WUA	Water User Association

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The LIFE IWRM is a joint activity of the Ministry of Water Resources and Irrigation and the United States Agency for International Development. It is carried out under the auspices of the Livelihood and Income from the Environment, Integrated Water Resources Management Project (LIFE IWRM). The Project is the responsibility of International Resources Group, Ltd. (IRG).

In particular, the LIFE IWRM Chief of Party, the LIFE IWRM team, and working group members, would like to acknowledge the contributions and support of the many senior officials of MWRI. Policy and technical guidance provided by the following individuals was significant and is greatly appreciated: Eng. Gamil Mahmoud, Chairman of the MWRI Steering Committee and the MWRI Integrated Water Management Unit; and Dr. Ross Hagan and Dr. Wafaa Faltaous of USAID.

Executive Summary

OBJECTIVES

The objective of Task #4 was multi-faceted. Foremost, the aim was to determine whether Egyptian farmers, particularly those in the Integrated Water Management Districts, are in need of improved service for the maintenance and repair of their irrigation equipment, namely diesel pumps. Secondly, the aim was to determine whether Egyptian farmers from these areas where Branch Canal Water Users Associations are being established, are in need of basic business training to appropriately manage the associations. And thirdly, to determine whether or not the Governorate technical schools administered by the Ministry of Education (MOE) have the capacity to provide either the training for mechanics of irrigation equipment , and/or the basic management skills training for the BCWUA board members. The assessment team also considered the potential or willingness of these institutions to develop training for irrigation equipment mechanics, and/or BCWUA members in computer use, and basic business management, if such programs were not currently available.

To address these objectives, a rapid assessment consisting of focus groups with farmers, as well as meetings with staff and tours of both vocational and technical schools in the project's priority Governorates was conducted. The assessment focused on the needs of the BCWUAs being formed under Task #2.

ACTIVITIES

Task #4 activities completed as part of the rapid assessment include the following:

- Conducted focus groups with BCWUA members from target Governorates to determine need for qualified mechanics, as well as self perceived need for training to manage the Branch Canal Water Users Associations
- Investigated training opportunities offered by agricultural, industrial, and commercial technical schools.
- Analyzed the training needs, offerings available through existing institutions, and the quality and relevance of the training for mechanics and for strengthening the skill and performance of BCWUA members.
- Explored willingness and potential of technical schools to provide either type of training.

KEY FINDINGS

In summary, the Task # 4 team findings are as follows:

Access and Improved Repair/Maintenance of Irrigation Equipment

- Concur with the USAID funded study conducted by Michael Ross from Sandia National Labs, USA, that availability of mechanics to repair pumps is not a major issue for farmers. Access to mechanics is not a problem for farmers.
- Farmers do complain about the quality and cost of repair, but attribute this to poor quality spare parts rather than the capability or training of mechanics.

Business Management Skills and Training

- A majority of BCWUA board members do not perceive a need for basic business training. As leaders in their communities, the majority self-report basic business management skills by virtue of their experience serving on local councils, NGOs or CDAs, tasks requiring similar skills. And as farmers they self-report familiarity with managing money and handling accounts.
- If BCWUA board members do not have computer skills, they report relying on other community members with access to a computer. As the BCWUAs are not supplied with computers, the skill is not perceived as immediately relevant or necessary.

Capability of Technical Schools to Provide Training

- Technical schools were found to be in serious need of reform to help students and address the employment situation in the country.
- Some industrial technical schools do offer hands-on mechanical training with diesel engines, but no training focused specifically on irrigation pumps. Agricultural technical schools introduce students to the use of irrigation equipment, but do not teach repair or water management concepts.
- Commercial technical schools offer computer, accounting, and business management programs for students enrolled in full-time, three year programs. However, there is no business management training available on a part-time basis appropriate for adult education.
- All technical school administrators interviewed were open to the possibility of developing specialized training programs if technical assistance and funding were made available.

Recommendations

In summary, the Task # 4 team recommends the following:

Access and Improved Repair/Maintenance of Irrigation Equipment

- If funds are available from other sources, the project could develop public awareness materials to encourage farmers to invest in name brand, quality parts rather than the locally manufactured replacement parts. In addition, an educational booklet on simple pump repairs and preventive maintenance as well as a section on business management and farm book-keeping could be produced. The USAID / Office of Education offered to help in this activity.
- If funding can be secured additional training seminars on pump maintenance and simple repairs could be organized and offered for interested farmers through BCWUAs. This will involve hiring experts in the field to prepare the training materials and conduct the training.

Business Management Skills and Training

- Although majority of board members currently do not self-report a need for business training, experience in the formation of water user associations indicates that BCWUAs would benefit from basic business planning/management, as well as training in budgeting/accounting, particularly once Law #12 is passed enabling BCWUAs to collect user fees. When additional funding can be secured for this purpose, the Task #4 team recommends that on-the-job training be provided by the project to BCWUA members. This training could be offered in conjunction with the distribution of small grants to BCWUAs to implement activities identified in their Action Plans.

Capability of Technical Schools to Provide Training

- To prepare better qualified mechanics for the future specialized in the repair and maintenance of agricultural & irrigation equipment, the Task #4 team recommends that USAID encourage the MOE and the Central Department of Technical Education to develop a specific, licensed career track for young persons in rural areas interested in providing this service. If funding were made available Technical Schools/or the alternative Technical Training Centers should provide specific certificate tracks to qualify water equipment mechanics.
- Although reforming the technical school programs is far beyond the scope of this project, the Task #4 team recommends that USAID encourage the MOE and the Central Department of Technical Education to develop and promote various short evening courses for adults. This type of training is essential for life-long learning, and should be locally available at minimal cost for those interested and/or driven. If well-designed, packaged and promoted, the short courses for adults would be in

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keeping with market forces and appropriate to a vibrant, ever changing economy. To benefit BCWUA members' short course offerings could include business planning and management, leadership skills, and bookkeeping and accounting.

- The Task #4 team recommends that age appropriate water resources concepts including water user participation, be added to ALL public school programs from primary through secondary. This recommendation is based on Egypt's limited water resources and future demand in the region. Water is a valuable commodity. Efficient water use is a top priority for the country.

Introduction to the LIFE–Water Project

Over the last two decades, the United States Agency for International Development (USAID) has provided technical assistance to the Ministry of Water Resources and Irrigation (MWRI) toward improving water management to benefit the economy of Egypt. The current initiative is known as the LIFE-Water or the Integrated Water Resources Management (IWRM) Project, and is providing technical assistance, training, commodities and small grants to support the MWRI decentralization of water management. The aim is to increase water use efficiency and productivity through the replacement of Inspectorate and traditional District administrations with Integrated Water Management Districts (IWMDs). Each newly formed Integrated Water Management District brings irrigation, drainage, and ground water departments together as a single management unit with greater capability and authority at the district level than ever before. In addition, each IWMD is linked with Branch Canal Water User Associations throughout the area served.

IWRM Project Activities are organized in three areas and consist of seven major tasks.

- **Performance Requirement I: Decentralized Management of Water Resources**

- Task #1:** Formation of Integrated Water Management Districts

- Task #2:** Formation of Branch Canal Water User Associations

- Task #3:** Equitable Allocation of Water Resources

- **Performance Requirement II: Stakeholder Engagement in Water Resources Management**

- Task #4:** Improved Maintenance and Upgrading of water Management Equipment

- Task #5:** Environmental Services for Improving Water Quality Management

- Task #6:** Improved Wastewater Reuse Practices

- **Performance Requirement III: Capacity building for MWRI Staff**

- Task #7:** Graduate Degree Training for MWRI

During the life of the project, the Integrated Water Resources Management Project activities will focus on four directorates; Zifta and West Sharkiya in the Delta, and Qena and Aswan in Upper Egypt. It is anticipated that approximately six million farmers and other water users will benefit from the project with the establishment of 25 IWMDs linked with approximately 1,000 BCWUAs.

Background

Task #4: Improved Maintenance and Upgrading of Water Management Equipment falls within **Performance Requirement II: Stakeholder Engagement in Water Resources Management, and** contributes to improved water use efficiency. Water pumping is a main factor in the cost analysis of crop production in Egypt. Ensuring efficient performance of diesel irrigation pumps through maintenance and operation could reduce the item cost of water lifting and increase water use efficiency. At the time the USAID Life-IWRM project contract was written the understanding was that “IWMDs, Water Boards, BCWUAs, and farmers currently do not have access to low-cost small shop repair and maintenance facilities for water management equipment.” Subsequently, a USAID-funded study carried out by Michael Ross from Sandia National Labs, USA, found that farmers have no problem finding mechanics to service their pumps. This indicated that pump repair may be a non-issue.

Task 4 activities were therefore designed to verify this finding by focusing on whether Egyptian farmers, particularly those in the Integrated Water Management Districts, were in need of improved service for the maintenance and repair of their irrigation equipment. If a shortage of qualified mechanics was identified, the idea was to explore possible ways to strengthen or improve existing training to create new job opportunities for rural young people, and thereby increase farmers’ access to a quality service. This goal, according to the contract, was also in line with the strategic objectives of the AERI project with which Life-IWRM project is to cooperate. Toward these ends the Task #4 team was to conduct focus groups with farmers to learn if qualified mechanics were needed and whether farmers had any concerns regarding pump repair and maintenance.

In addition, according to the contract the project was asked to “assess the capacity of the governorate technical schools to provide training in the repair and maintenance of irrigation equipment, and in business management.”

During the pilot project with a scope of work consisting of four Districts, the Irrigation Advisory Service (IAS) provided extensive training for both BCWUA representatives and IWMD staff. However, as the project began addressing the challenge of implementing the integrated water management concept in 27 IWMDs, and considered how the model would eventually be implemented by the MWRI nationally, it became apparent that the IAS would be stretched beyond capacity if they were to attempt to meet all the training inherent to the establishment and operation of IWMDs and BCWUAs. It would therefore be ideal, and in keeping with the concepts of integration, and decentralization, if appropriate local training opportunities could be found or adapted to meet the needs of BCWUAs, and even potentially to meet some training needs of the newly appointed IWMD staff. A rapid assessment of technical schools was therefore conducted to determine whether training of either type, could be provided through these existing institutions.

Objectives

The overall objective of this task was to assist the MWRI in its efforts to devolve authority to the IWMDs and the BCWUAs by determining availability of needed services, and by assessing availability and quality of training to develop these skills and services locally. For decentralization of water management to be successful, farmers and BCWUAs require access to trained persons qualified to repair and maintain irrigation tools and equipment. In addition, both BCWUA representatives and IWMD staff require particular skill sets for which individuals may need training to fulfill their respective roles and responsibilities.

Specifically, the purpose of Task 4 was to assess:

- Farmers and BCWUAs access to trained persons qualified to repair and maintain irrigation tools and equipment.
- Board members' perceived need for training to manage the Branch Canal Water User Associations.
- Capacity of the Agricultural and Industrial Technical Schools in the Governorates to provide training in the repair and maintenance of agriculture and irrigation tools and equipment.
- Capacity of Commercial Technical schools in the Governorates to provide training in basic business management, computer skills and bookkeeping appropriate for BCWUA representatives and IWMD staff.

Rapid Assessment: Approach and Methodology

The LIFE-IWRM Project Task Team relied on focus group meetings with BCWUA members in order to assess their needs and then investigated the capacity of local technical schools to provide practical training.

Activities under Task 4 to meet the objectives above were as follows:

Activity 1: Verify Findings on Pump Maintenance

- Develop questions for inclusion on farmer surveys conducted as part of BCWUA formation and M&E baseline
- Conduct focus groups drawn from BCWUA members in target Governorates
- Analyze findings
- Recommend next steps

Activity 2: Determine Training Needs of BCWUA

- Develop questions for inclusion on Focus Group Discussion Guidelines

Activity 3: Conduct Rapid Assessment of Training Facilities

- Meet with Ministry of Education representatives

- Develop research plan and tools
- Select schools and training centers
- Conduct site visits of Agricultural, Industrial, & Commercial Technical Schools
- Conduct interviews with educators
- Review training materials if available
- Analyze findings
- Recommend next steps.

The Task 4 team conducted a rapid assessment of technical schools in three of the project's four priority governorates to determine quality and relevance of training available in the repair and maintenance of irrigation equipment, as well as in business management. These schools are administered by the Central Department of Technical Education within the Ministry of Education (MOE). To ensure that quality training opportunities were not overlooked and to give some sense of a qualitative base line for the assessment, the team included one of Egypt's model agricultural vocational schools located in Aswan.

Focus Group Discussions

Site Selection and Composition --Last year USAID supported the establishment of four Integrated Water Management Districts in three Irrigation Directorates: Ibrahimiya in Sharkiya, Zifta in New Zifta, as well as Esna and Luxor in Qena. As irrigation conditions and techniques in Lower and Upper Egypt vary respectively, the Task #4 team selected one District in the project area of the Delta and another one in Upper Egypt. The plan was to begin by conducting two focus group meetings, each consisting of approximately 10-15 BCWUA board members. Then if deemed necessary based on the findings of this first round, to conduct one or two additional focus groups in the other project Directorates.

Discussion Content Areas

- Assess BCWUAs members' need for improved maintenance and repair of water management equipment, specifically irrigation pumps and canal maintenance equipment, including:
 - Commonly used equipment
 - Frequency and need for maintenance and repair
 - Availability of repair and maintenance services
 - Satisfaction with mechanics level of training/performance
 - Availability of spare-parts in the local market
 - Ability or training needs for BCWUAs members on operation, maintenance and repair of their own equipment.
- Assess BCWUA board members' business skills and training needs related to management of the association, including:
 - Any relevant education or training
 - Previous or related experience

- Meeting management and documentation
- Financial planning and account management
- Legal status and laws governing BCWUAs
- Community participation mobilization.

The Task #4 team conducted three Focus Group meetings, one in Lower Egypt and two in Upper Egypt. It was deemed unproductive to conduct additional sessions as findings were similar in all three groups. The response from invited BCWUA board members was greater than anticipated and therefore the number of overall participants was higher than planned.

Technical School Site Visits and Interviews

In keeping with the Objectives and Activities outlined above, the Task #4 team also conducted site visits and interviews with the staff of three technical industrial schools, two technical agricultural schools and two technical commercial schools.

In addition, an interview was arranged and conducted with one mechanic from a private workshop in Sharkiya Governorate. The team did not pursue additional interviews with mechanics as it became clear from both the Focus Group sessions and the technical school visits that mechanics do not receive training specific to irrigation equipment, but rather acquire this knowledge through on-the job experience. Further interviews were, therefore, outside the scope of this assessment.

Table 1 shows the number of events and participants in Focus Group discussions and technical school interviews. Annex 1 lists names of those involved in the discussions.

Table 1 Events and Number of Participants

Event	Location	No. of Events	No. of BCWUAs Represented	Total No. of Respondents
Focus Group Meetings	Lower Egypt	1	4	20
Focus Group Meetings	Upper Egypt	2	5	26
Interview Industrial Schools	L. & U. Egypt	3		14
Interview Agricultural Schools	U. Egypt	2		15
Interview Commercial Schools	L. & U. Egypt	2		14
Total		10	9	89

During the Focus Group sessions and Technical School interviews, the Guidelines included as Annex No. 2, prepared in advance and approved by the project and USAID, were followed. Sessions and interviews were recorded and the tapes totaling approximately 10 hours have been archived with the project.

Findings based upon focus groups and technical school site visits were:

Pump Repair Issues

- Pumps are more extensively used in Lower Egypt than in Upper Egypt especially in Aswan, where most “old lands” are irrigated by gravity since there are pump stations at the head of canals. Only in the “new, reclaimed lands”, are farmers obliged to pump to irrigate. However, during peak demand in summer months, most farmers in both old and new lands must use pumps for irrigation when they suffer shortage of water in canals.
- Diesel fuel powers most pumps. In Upper Egypt there are electrical pumps where there is access to power lines.
- The most frequently owned pumps are diesel powered. The most popular brand is imported from Indian and is locally assembled.
- Workshops for pump repairs are readily available in each location. Farmers have access to services, and in many cases mechanics do maintenance on-site.
- A majority of farmers complained about quality of service for pump repairs. They stated that in many cases repairs are not as good as they expect. After a few days of use, pumps break down and require repair again.

- Spare parts are available in the local market. However, they are not original parts and the quality is poor and not durable.
- Farmers do not trust mechanics to tell the truth about the price of spare parts.
- A few farmers in Lower Egypt stated that they can undertake small repairs on their own, but they consult mechanics for large repairs.
- Mechanics are not trained graduates of schools. They gain experience on the job through practice.
- In one session, participants suggested establishing pump repair workshops attached to BCWUAs to provide service that was of higher quality, faster, and less expensive. After discussion the majority did not favor this approach.
- Some participants thought the idea of training and employing new graduates of secondary technical schools was good. Others expressed a clear lack of confidence in the quality of any training provided by these schools.

Business Management Readiness

- Some BCWUA board members are also members of local councils, NGOs and Community development Associations (CDAs).
- Some BCWUA board members are university graduates and a few have engineering degrees.
- Concerning the administrative management of BCWUAs, some board members stated that they need training on financial and administrative management and preparing annual plans. However, in Upper Egypt, most of the members even those belonging to newly established BCWUAs stated that they have the experience to conduct meetings and prepare plans.
- Most farmers stated that they do keep their own farm records or accounts although in a simple way. Some of them keep books others rely on their memory or notes.

Industrial Technical Schools

It is common to find one industrial school or more in each District. In terms of public perception, the industrial technical schools rank higher than the agricultural or the commercial technical schools. Students accepted for training in industrial technical schools must receive high grades in the final preparatory school exam than students accepted in the other types of technical schools. The duration of study in most of the industrial school programs is three years. Most of these schools have both male and female students.

The team visited three industrial technical schools during this assignment, interviewed the staff, and found:

- One technical school director explained that the MOE has 185 different technical programs for industrial education. From these programs or career tracks each school selects those programs that will provide the most appropriate skills for students living in that area.

- Sample program offerings included furniture making, building construction, interior decorating, electrical appliances, and diesel engines.
- None of the programs or career tracks dealt specifically with water management equipment.
- Only one school of the three visited offered any training in pump repair. This school has a workshop with demonstration equipment including an irrigation pump for hands-on learning. This department is only for boys. In addition, this school serves as a testing site and periodically administers tests of workshop employees based on requests from the Ministry of Manpower. During discussion with the staff it emerged that the focus of the school is on diesel engines for tractors and not on small engines such as pumps.
- In the other industrial technical schools visited, there were no model irrigation pumps for demonstration. When the team asked about training on irrigation pumps, the staff indicated that training on diesel engines would satisfy the need. Some of the interviewed staff stated that students need practical training.
- One of the industrial schools was willing to provide special training courses to the public for a fee, if the request was approved by the MOE.

Agricultural Technical School Education

- Agricultural Technical Schools do provide classes on water resources including surface or Nile water, ground water, and water quality issues. Students also learn how to use different types of irrigation systems such as surface, sprinkler, and drip irrigation as part of the program. However, none of these classes deals with maintenance or repair of irrigation pumps, or sprinkler and drip systems. The focus is only on operation of the various systems. The Task #4 team was referred to the industrial technical schools for possible offerings.
- Directors and teachers expressed an interest in water resource management issues and would welcome supplementary materials or visits from MWRI/IWMD staff to better inform their students.

Commercial Technical School Education

- Commercial technical schools do offer full-time 2-3 year courses in computers, accounting, secretarial skills, business management, and languages. However, the quality of instruction appears marginal and is not well regarded.
- Computer labs are available in all schools.
- There are no specific classes on farm management.
- While classes in accounting/bookkeeping or secretarial skills may be of benefit to BCWUA members, there is no provision for part-time or adult learners.
- With approval of the MOE and for a fee, a special program could be developed and implemented for adult learners using the commercial technical school facilities and trainers.
- In all technical schools visited, the directors stated that graduates were likely to be unemployed or underemployed after graduation. None were able to provide any statistics about their graduates and appeared surprised at the question. Employment for these young adults is a serious problem in all Directorates/Governorates visited.

Mechanic Workshops for Pump Repairs

- Workers in the mechanic workshops are not trained at technical schools. They gain experience through practice on the job. These tend to be small family owned operations.
- These workshops deal with all types of pumps.
- They do make field visits for maintenance and repair when farmers call.
- Spare parts are usually available in the local market and if not in adjacent areas. The issue is limited availability and high cost of quality imported spare parts and willingness of farmers' to make the investment.
- These mechanics undergo periodic testing and certification by the Ministry of Manpower

Key Findings

Access and Improved Repair/Maintenance of Irrigation Equipment

- Availability of pump repair is not an issue in the project areas. The only concern is quality of parts and service.
- This assessment concurs with the USAID-funded study conducted by Michael Ross from Sandia National Labs that availability of mechanics to repair pumps is not a major issue for farmers.
- Farmers do complain about the quality and cost of repair, but attribute this to poor quality spare parts rather than the capability or training of mechanics.
- Some BCWUA board members suggested establishing private workshops as an association and employing graduates of industrial technical schools who do not have jobs. However, actual implementation poses difficulties, as well as potential adverse effects. First, some farmers mentioned that new graduates do not have sufficient experience, and they would prefer to go directly to experienced mechanics. This suggests a low success rate for such a venture. Second, initial funding for establishment would pose a challenge, as adequate funds are not available through the project. The Social Fund for Development might provide assistance if the BCWUA pursued this option collectively. Third, establishment of new workshops, if successful might cause loss of jobs or market share to existing private sector workshops. For the time being, the LIFE-IWRM project does not find it advisable to encourage BCWUAs to take this step.
- The Ministry of Manpower's instruction that all mechanics must pass an annual test at the industrial technical schools is one way to improve quality of service. If this requirement applied nationwide, and were implemented, this will have a positive

impact on the skill level and quality of service provided by mechanics servicing pumps.

- Investment in providing a short training on pump maintenance and simple repair for approximately 2 million farmers (only 1/3 of the farmers in the project area) would not be feasible under the current level of funding. The LIFE-IWRM project may consider producing a hand-out on regular pump maintenance to be distributed to each BCWUA to share with farmers.

Business Management Skills and Training

- A majority of BCWUA board members do not perceive a need for basic business training. As leaders in their communities, the majority self-report basic business management skills by virtue of their experience serving on local councils, NGOs or CDAs, tasks requiring similar skills. And as farmers they self-report familiarity with managing money and handling accounts.
- If BCWUA board members do not have computer skills, they report relying on other community members with access to a computer. As the BCWUAs are not supplied with computers, the skill is not perceived as immediately relevant or necessary.
- Despite self-reporting BCWUAs members would no doubt appreciate and benefit from business management training, particularly once Law #12 is passed and the associations are able to collect fees and enter into contracts.

Capability of Technical Schools to Provide Training

- Technical schools were found to be in serious need of reform to help students and address the employment situation in the country.
- The capacity of the technical schools in the Governorates to provide training in the repair and maintenance of irrigation tools and equipment varies widely as each school offers a limited array of career tracks. Some industrial technical schools offer hands-on mechanical training with diesel engines, but no training focused specifically on irrigation pumps. Agricultural technical schools introduce students to the use of irrigation equipment, but do not teach repair or water management concepts.
- Employment for these graduates is a serious problem in all Directorates/ Governorates visited.
- Commercial technical schools offer computer, accounting, and business management programs for students enrolled in full-time, three year programs. However, there is no business management training available on a part-time basis appropriate for adult education.
- All technical school administrators interviewed were open to the possibility of developing specialized training programs tailored to meet the requirements of the

Life-IWRM Project, the Ministry of Water Resources & Irrigation (MWRI), or BCWUAs if technical assistance and funding were made available.

Recommendations

In summary, the Task # 4 team recommends the following:

Access and Improved Repair/Maintenance of Irrigation Equipment

- If funds are available from other sources, the project could develop public awareness materials to encourage farmers to invest in name brand, quality parts rather than the locally manufactured replacement parts. In addition, an educational booklet on simple pump repairs and preventive maintenance as well as a section on business management and farm book-keeping could be produced. The USAID / Office of Education offered to help in this activity.
- If funding can be secured additional training seminars on pump maintenance and simple repairs could be organized and offered for interested farmers through BCWUAs. This will involve hiring experts in the field to prepare the training materials and conduct the training.

Business Management Skills & Training

- Although majority of board members currently do not self-report a need for business training, experience in the formation of water user associations indicates that BCWUAs would benefit from basic business planning/management, as well as training in budgeting/ accounting, particularly once Law #12 is passed enabling BCWUAs to collect user fees. When additional funding can be secured for this purpose, the Task #4 team recommends that on-the-job training be provided by the project to BCWUA members. This training could be offered in conjunction with the distribution of small grants to BCWUAs to implement activities identified in their Action Plans.

Capability of Technical Schools to Provide Training

- To prepare better qualified mechanics for the future specialized in the repair and maintenance of agricultural & irrigation equipment, the Task #4 team recommends that USAID encourage the MOE to develop a specific, licensed career track for young persons in rural areas interested in providing this service. If funding were made available technical schools/or the alternative technical Training Centers should provide specific certificate tracks to qualify water equipment mechanics.
- Although revamping the technical school programs is far beyond the scope of this project, the Task #4 team recommends that USAID encourage the MOE to develop and promote various short evening courses for adults. This type of

Task #4 Improved Maintenance And Upgrading Of Water Management Equipment

training is essential for life-long learning, and should be locally available at minimal cost for those interested and/or driven. If well-designed, packaged and promoted, the short courses for adults would be in keeping with market forces and appropriate to a vibrant, ever changing economy. To benefit BCWUA members' short course offerings could include business planning and management, leadership skills, and bookkeeping and accounting.

- The Task #4 team recommends that basic age appropriate water resources concepts including water user participation, be added to ALL public school programs from kindergarten through secondary school. This recommendation is based on Egypt's limited water resources and future demand in the region. Water is a valuable commodity. Efficient water use is a top priority for the country.
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Annex 1: Meetings and Interviews

Focus Group Meetings with BCWUAs

1. Focus Group Meeting with BCWUAs at Ibrahimiya IWMD, West Sharkiya Directorate. Participants were 16 members of 4 BCWUAs.
2. Focus Group Meeting with BCWUAs at Edfu IWMD, Aswan Governorate. Participants were 10 members of 2 BCWUAs.
3. Focus Group Meeting with BCWUAs at Luxor IWMD, Qena Governorate. Participants were 16 members of 3 BCWUAs.

Interviews with Industrial Technical Secondary Schools Staff

1. Amr Allah Baligh Industrial Secondary School, Ibrahimiya IWMD, West Sharkiya Directorate. Mr. Abdalla Hafez, Director.
2. Edfu Industrial Secondary School, Edfu, Aswan. Mr. Abo El-Soud Ahmed Mahmod, Director.
3. Luxor Industrial Secondary School, Luxor, Qena. Mr. Badaba Mankarious, Director.

Interviews with Agricultural Technical Secondary Schools Staff

1. Edfu Agricultural Secondary School, Edfu, Aswan. Mr. Ahmed Abd El-Meuid, Director.
2. El Karana Agricultural Secondary School, Luxor, Qena. Mr. Kamal M. Ibrahim Abu Zied, Director.

Interviews with Commercial Technical Secondary Schools Staff

1. Kefor Nagm Commercial Secondary School, Ibrahimiya IWMD, West Sharkiya Directorate. Mr. Hefni El-Sayed Hefni, Director.
2. Luxor Commercial Secondary School, Luxor, Qena. Ms. Sabah Gharib, Headmaster.

Interview with Pump Repairs Workshops

1. Moustafa Mahmoud Hasan Workshop, Ibrahimiya IWMD, West Sharkiya Directorate

Annex 2: Guidelines for Focus Group Discussion with BCWUA Board Members

Focus group discussions will be held locally in a private room that is comfortable to the participants. Participants will consist of 10–15 board members representing approximately three branch canals in the IWMD. Each participant will be given opportunities to speak. Session will not exceed 2 hours.

Each focus group discussion will be led by an experienced facilitator, who will be assisted by another member of the project team. The session will be recorded by a note taker and on audio tape for analysis.

Women representatives will be encouraged to participate even if they are not board members. However, their participation will not be deemed essential if women in the area have clearly stated to investigators why the topics to be discussed are not relevant.

Guided Discussion

Opening

- Welcome
- Introduction/Getting to Know Each Other
- Expectations/Clarifying what this meeting **is** about and what this meeting **is not** about
- Explanation of meeting protocol and objectives

Maintenance and Repair of Water Management Equipment

- What are the equipment / machines / tools you use for irrigating you fields? (Create list of machines and tools as a group)
- What are the types (diesel, electric) most frequently used?
- Why? (List as a group)
- What are the most common BRANDS used by farmers? (List as a group)
- What are the most common problems or complaints with pumps? Other equipment?
- What do farmers do regarding repair and maintenance if needed?
 - Do they do some/all themselves?
- If not how do farmers get equipment repaired?
- By whom? Where? (List available shops and addresses so we can follow-up with visits if necessary)
- What is the quality of service?
- Is s/he trained? Well trained?
- How or where are service providers trained?
- Are spare parts / accessories / repairing and maintenance facilities available?

- Where do you usually find the spare- parts?
 - In the local market?
 - In the district?
 - In the governorate capital?
 - In Cairo?
 - Other?
- How do you find them? Easily/ with difficulty? What are these difficulties?
- If there are difficulties in fixing/ maintaining the pumps and/or other machinery what are they? What do you usually do to address that?

(Tea and Snack Break - 15 minutes)

Business Management Skills and Training Needs of BCWUA Board Members

- How long has your BCWUA been operational?
- What are your roles and responsibilities as board members?
- What are you currently doing as a board? As an individual board member?
- How comfortable are you with your role and responsibilities?
- What skills are or will be required? (List as a group)
 - To organize meetings
 - To document meetings
 - To ensure membership is participating
 - To determine priorities
 - To manage conflicts
 - To understand and manage within the legal framework
 - To prepare work plans
 - To present work plans to representative committees and the IWMD
 - To raise money/plan expenditures/keep accounts
 - If records are not yet needed for the BCWUA, explore how farmers keep records of their business? (no record, block note, with assistance of son/daughter/wife) Do farmers need accounts to manage their business? Do farmers use monthly/seasonal or annual financial balances? Who does it? What is his/her experience?
 - To mobilize members
 - To organize and manage records.

Exercise: Following initial discussion on the above points, the facilitator will provide some sample documents from other BCWUAs and ask that they all take a few minutes to review the samples. Facilitator may also ask whether they have sample documents that they would like to share with the group. After everyone has had an opportunity to look through the

Task #4 Improved Maintenance And Upgrading Of Water Management Equipment

samples, the facilitator will open discussion again regarding required skills to carryout the above list of tasks.

- Do you have the required skills?
- If not what do you do? What will you do to meet your obligations?
- Is assistance available? Where? How? Who assists?
- Is any training needed? If so, what kind of training would be useful? For whom?
- If so, how or where would you go about getting the training?
- What are the practical considerations that would impact your ability to receive training?

Annex 3: Focus Group Meeting and Technical Schools Staff Interview at Ibrahimiya IWMD

Date: April 13, 2005

This report is a summary of about 4 hours of tape records captured during all meetings, which were held in Arabic.

Interviews at Technical Schools

There are five technical secondary schools in Ibrahimiya District. Three of them are commercial schools, one is industrial school and one is nursing school. The Task #4 team selected the industrial school and a commercial school to interview the director and the staff.

Amr Allah Baleigh Industrial Secondary School, Ibrahimiya

Mr. Abdalla Hafez, Director, and Mr. Mahmoud, Technical Director, were interviewed. Mr. Abdalla requested the LIFE-IWRM Team to meet first with the students and the staff and raise their awareness about water issues and pollution. The team accepted the request just to support the director. About 40 students and 5 of the school staff attended the first session on water issues in Egypt. After the unplanned session, the team met with the director and six of the school staff.

The purpose of the meeting was to investigate the possibility that the school might help the BCWUAs and to see how the school could assist the agricultural community. The following are the issues discussed:

- There is a department in the school specializing in agricultural equipment. This department is only for boys.
- There are seven departments within the school
- The program lasts for 3 years.
- There are 1,100 students, 760 of them are boys.
- Ninety percent of the students are from Ibrahimiya and the rest are from Hehya.
- Students receive training during 1 summer month; following graduation, there is no follow-up training.
- Employment opportunities for graduates are limited. The majority contribute their know-how to their own family. None of graduates has established a business as a water pump repairman. Sixty percent return to work on their farm.
- The school tests skills of workers based on the Ministry of Manpower requests.
- Training could be provided to BCWUAs on pump repairs, if it is required.
- Classroom sessions consume 50 percent of time; the balance is practical training.
- The library does not have any books on water or any subjects related to water management.
- The school offers courses on business management.

- At the school workshop, there are models for a tractor, diesel pumps, and some agricultural field machinery used for practical sessions.
- Students are trained on local or Indian types of pumps.
- Staff said farmers would need only a week for training sessions on pump repairs.

Kefor Negm Commercial Technical School (mixed girls and boys)

Ten male teachers, including Mr. Mohamed Abd El-Razek, Mohamed Nassar, Khaled Ahmed, ElSyed Yousef, Mohamed Abu-Elfetouh, were interviewed, along with Mr. Hefni El-Sayed Hefni, Headmaster, Mr. Goda Mekawi, Director, and Shehta Fouad, Deputy Director.

The meeting was held in the Director's Office. The LIFE-IWRM Project introduced the purpose of the meeting with a brief introduction on the project and the integrated water management concept and benefits to water users. The link between the project and the school staff was discussed.

- There are 710 students: 496 girls and 214 boys. All of them are from Ibrahimiya District and fewer than 1 percent are from nearest villages in the district.
- There are 53 teachers: 31 men and 22 women.
- Commercial student entrance scores are generally lower than students entering industrial schools (top among technical schools) or agricultural schools.
- Students range in age from 16–19. This is a 3-year program.
- Few of the graduates get a job after graduation. A very few of them get job in the private sector with low salaries.
- Some of the staff have information on BCWUAs.
- Subjects include computers, accounting, secretarial skills, management of small businesses, and languages.
- Practical classes consume 33 percent of total class time.
- Class programs include:
 - Computers: two computer labs with a total of 30 computers and one dial-up Internet connection
 - Accounting for government and finance
 - Secretarial studies
 - Languages: English, Arabic, and French
 - Small project or business management.
- Computer students are trained on Word, Excel, and Access.
- The school can provide computer training to adults during summer vacation.
- There are no specific classes on farm management; however, the students get accounting basics, which could be applied to any accounts. The classes specific to farm accounts are conducted in the agricultural schools.
- Most of students are from the rural area.

Focus Group Meeting at the Ibrahimiya IWMD with BCWUAs

- The meeting was conducted in the Ibrahimiya District Training Office.
- Four BCWUAs board members were invited to attend. One of the BCWUAs, El Hosan, was established 3 years ago under Water Board Project and it is now receiving institutional strengthening assistance under LIFE–IWRM. The other three—Ibrahimiya, El Hasfa, and El Beheira el Tahtania—were established last year through the Improved Water Management Project. In addition, five IAS members and the District Manager, Eng. Ali Abdel Hafiz, were presented.
- At the beginning of the meeting, the attendees were briefed about the purpose of the meeting: to investigate the needs of BCWUAs for training to enhance their skills to conduct repairs for their field water management equipment and for BCWUA business management.

Pump Repairs and Other Water Management Equipment:

- Concerning pump repairs, attendees stated that workshops are located only at the district level. There are no workshops in the villages. It takes 1 or 2 days for a mechanic to respond to a call to repair a pump. In many cases, the quality of repairs is not adequate. The problem may arise again after a few days.
- In case of large repairs, the pump must be taken to the district, Mansoura, or Zagazig.
- Some attendees suggested establishing a work shop for pump repairs attached to the IWMD. It would provide required repairs and maintenance services on an at-cost basis. Farmers would be more willing to pay this work shop.
- Other participants suggested establishing one central workshop at the district level, and other branches at each BCWUA location.
- Some spare parts are available at the district level, and those for large repairs are available in Zagazig or Mansoura. Participants suggested establishing a spare parts shop attached to the IWMD to serve BCWUAs.
- The LIFE–IWRM facilitator told participants that the project would prefer that any work shop or spare parts shop established should fall under BCWUAs, as they are private sector agencies.
- Some participants suggested that graduates of industrial technical schools could get loans from the Social Fund for Development to establish the suggested workshops or spare parts shops.
- It was suggested to try making use of the workshops within the industrial schools or production associations at the district level.
- One board member suggested that each BCWUA might buy an agricultural waste recycling machine to reduce burning of rice straw.

Business Management

- Attendees requested training on financial management, communications, and planning.

- Farmers rely on their memory to manage their business. No farm book record keeping has been practiced except by large-scale farmers when they deal with the agricultural cooperatives.
- Training is needed on meeting management and the transfer of messages or decisions of the meetings to the other members of the BCWUA

Other Issues Related to BCWUAs

- Attendees requested a legal framework for their BCWUA, which would empower them and allow other entities to recognize them. They stated that they do not have the authority to communicate with governmental agencies or to collect money.
- Participants requested an explanation of voluntary work before they discussed the articles of their own internal regulations. It is a new concept for them.
- Water users suggested that MWRI should approach them before making improvements to the irrigation system such as covering canals. Farmers may have simple, practical, and cheaper solutions. Farmers mentioned that covering a canal and replacing it with pipes causes irrigation problems due to the contraction of the section and trash blocking the pipes.
- Environmental issues such as pollution of canals and drains and pollution caused by burning rice straw were mentioned along with their health impacts.
- Most of the participants asked that the District Manager appoint someone to summarize their meeting minutes and brief him/her on the issues and prioritize them. [*Eng. Ali, District Manager appointed Eng. Samir to be responsible about this task*]
- It was requested that each BCWUA should be informed about the boundaries of canals and drains. [*Suggestion: to have a map and list of users at each BCWUA*].

Interview with an Owner of a Workshop for Pump Repairs

There are five workshops for pump repairs in Ibrahimiya District. All the owners and workers are from one family. LIFE-IWRM interviewed one of the mechanics on 13 April 2005.

- He was trained by his uncle, not at a technical school, but periodically goes to the school for certification. The family is responsible for pump repairs in a wide area, and they hold service contracts with farmers for operation and maintenance.
- He repairs all types of diesel pumps.
- Sometimes he goes to the field to repair pumps on-site.
- Spare parts are available; however, some times he gets parts from Zagazig or Mansoura.

Annex 4: Focus Group Meeting and Technical Schools Staff Interview at Edfu IWMD, Aswan Governorate

Date: May 3, 2005

Interviews at Technical Schools

Interview with Edfu Industrial Secondary School, Edfu

The Project Task #4 Team met with Mr. Abo El-Soud Ahmed Mohamed, Director, and 10 of the school staff. The purpose of the meeting was to investigate the possibility that the school might help the BCWUAs and to discuss how the school could assist the agricultural community with basic pump maintenance and repairs and with other irrigation equipment. The following issues were discussed:

- There are eight technical departments within the school; however, none specializes in agricultural and irrigation equipment. The Director stated that the department of automobile mechanics within the school could provide this service. He said that the agricultural school may have this specialized department.
- Course duration is 3 years.
- The student body consists of 2,120 boys enrolled in the three grades.
- Employment opportunities for graduates are limited and most students return to their family business and contribute their know-how there.
- The school workshop has no pump models.

Interview with Edfu Technical Agricultural School

Mr. Ahmed Abd El-Meguid, Director, and 14 school staff members participated in discussions with Task #4 team members.

- There is a 45-feddan farm next to the school building. Students learn about irrigation using a sprinkler system.
- Field training on different types of irrigation systems—flood, sprinkler, drip, and drainage—is done during practical classes that help students apply their skills in new reclaimed land.
- A new, improved irrigation system through pipes is being tested in Kom Ombo in sugar-cane fields. This type of irrigation system requires lifting water by pumps.
- All students are from rural areas.
- The school trains students on operation of pumps.
- There are eight technical departments within the school.
- There are some classes on farm management.
- Some graduates may get opportunities to work at private farms in the new reclaimed areas.

- The student body consists of 2,153 boys and girls. Girls comprise 25 percent of the students.
- The project team visited the workshops and farms used for practical training. There are no devices for training the students on repair of pumps or irrigation equipment.

Focus Group Meeting at the Edfu IWMD with BCWUAs

- The meeting was conducted in the industrial school premises.
- Ten BCWUA board members, representing two BCWUAs, were invited to the meeting. The two BCWUAs were only recently established. Eng. Hassan, General Director of Aswan Directorate, and Edfu District Manager, Eng. Esam, attended the meeting and made good contributions.
- First, attendees were briefed about the purpose of the meeting: to investigate the situation in the district on the subject of availability and quality of services to repair pumps and other water management equipment. The Task #4 team also wishes to assess the BCWUAs' need for training to enhance skills to conduct repairs for water management equipment and for business management.

Pump Repairs and Other Water Management Equipment

- In Aswan, most of the irrigated area uses gravity or lifting systems.
- Water users stated that lifting irrigation water is more efficient and economically valuable because it improves the land and saves time. Water losses are high in flood irrigation by gravity.
- About 25 percent of the area is served by lifting systems, especially within newly reclaimed lands.
- The total cultivated land in Aswan is 278,000 feddans, including 178,000 feddans of old lands. Of the old land, about 10 percent use lifting systems.
- Peter brand pumps are widely used—an Indian brand that is locally assembled.
- There are local workshops for pump repair; however, repairs are expensive.
- Spare parts are available because the pump is locally manufactured.
- Mechanics are generally experienced, although they have not graduated from a technical school, but got their experience on-the-job.
- Establishment of a workshop for pump repairs might in providing good service.
- Participants suggested that graduates of the Agricultural Technical School could get loans from the Social Fund for Development to establish the suggested workshop.

Business Management

- BCWUA members said that they perform their own financial management.
- Farmers rely on their memory to manage their business. No farm book records are kept, except at large farms.

Other Issues Related to BCWUAs

- Attendees asked to have an office for their BCWUA.

Annex 5: Focus Group Meeting and Technical Schools Staff Interview at Luxor IWMD, Qena Governorate

Date: May 3 and 4, 2005

Interviews at Technical Schools

Luxor Industrial Secondary School, Luxor, Qena Governorate

Mr. Yehya Hassan El Noubi, General Director of Technical Education in Qena, Mr. Badaba Mankarious, Director of the School, Mr. Abd El-Fatah Heikal, Technical Director of the School, and 12 school staff members attended the meeting with the project's Task #4 Team. The purpose of the meeting was to investigate the possibility that the school might help the BCWUAs and how the school could assist the agricultural community with pump and other irrigation equipment maintenance and repairs. The following issues were discussed:

- The school's courses last for 3 years.
- The student body consists of 1,700 boys.
- The school operates with two shifts: morning and afternoon.
- There are five technical departments within the school: Cooling and Air Conditioning, Electricity, Welding and Smoothing, Mechanical Operations, and Machine Finishing. None specialized in agricultural and irrigation equipment such as pumps. The Director said that the department of automobile mechanics within the school could provide this service. He added that the agricultural school has practical training on operation of irrigation systems, but it does not deal with maintenance.
- Nationwide, there are 185 different specialized departments under technical industrial schools.
- Most of the staff are aware of the country's limited water resources and the need for efficient water use. However, the school does not have any arrangement for classes on irrigation management tools such as pumps, gated pipes, or land leveling devices.

Luxor Commercial School, Luxor, Qena Governorate

Mr. Yehya Hassan El Noubi, General Director of Technical Education in Qena, Ms. Sabah Gharib, Headmistress of the School for the morning shift, and four staff members attended the meeting with the Task #4 team. The meeting was held in the Director's Office. The LIFE-IWRM project team introduced the purpose of the meeting with brief discussion of the project, the integrated water management concept, and benefits to water users. The focus of discussion with the school staff was clarified: farm account management, keeping minutes of meetings, preparing plans, and secretarial support.

- The student body consists of 1,254 students in the morning shift and the same number in the afternoons. There are 1,079 boys and 1,250 girls.
- Duration of study is 3 years.

- There are five departments: Insurance, Warehouse Management and Procurement, Legal, Commercial Transactions, and General.
- All courses include some computer training.
- Students take classes on accounts and management but they do not get adequate practice and may need additional intensive training.
- Accounting classes cover public and private accounts.
- The headmistress suggested increasing awareness of water conservation and public misuse of potable water.
- The school does not offer training to public.
- Students are from rural areas.
- Not many graduates get job after graduation. Some take job with the private sector at low salaries.

El-Karana Agricultural Technical School, Luxor

Mr. Kamal M. Ibrahim Abu Zied, Director, met with the LIFE–IWRM team.

- There are 1,883 students in the school. Of these, 600 are girls.
- Departments include: Dairy, Produce, Gardens, Crops, Chemistry, and Irrigation and Survey.
- Under Irrigation and Survey, students study different types of irrigation systems and land leveling. They are trained only on operation of the systems.
- During installation of irrigation systems, students participate with the technicians.
- There is a workshop attached with the school that deals with tractors, pumps, and other tools.
- Pumps are electrical with 25 and 7.5 HP motors. They are used only for irrigation. The school has one diesel pump as a stand-by for emergency. This is a Peter brand pump, assembled in Egypt.
- The school sends pumps for repair to the qualified workshops in the village.
- Mechanics are experienced people. They are not school graduates.
- The school farm is 45 feddans in area. Sprinkler irrigation is used for training the students.
- There are no classes on practical maintenance of irrigation systems and tools.
- Students are from different categories of society.
- Students start their own businesses after graduation such as dairy farms, poultry farms, or farms specialized in animal breeding.
- There are classes on water quality and good irrigation practices.
- There is no specific awareness module covering water resources and water user participation through BCWUAs. The project suggested holding an awareness meeting with students and staff at the beginning of the school year. Mr. Kamal appreciated the idea. His phone numbers are: School: (095) 2231752 and H: (095) 22379232

Focus Group Meeting with BCWUAs at the Luxor IWMD:

The meeting was conducted in the IWMD Office and attended by Eng. Ayman, District Manager, and members of three BCWUAs. One of these BCWUAs, Elsalamia BCWUA, was established more than 2 years ago and the other two, Sahel Elshgab and Elterha El Alai, were established just last year. Sixteen BCWUA board members, representing three BCWUAs, attended the meeting.

At the beginning of the meeting the attendees were briefed about the purpose of the meeting: to investigate the availability and quality of repair service for pumps and other water management equipment, and to assess the needs of the BCWUAs for training to enhance their skills in conducting repairs on water management equipment and managing the BCWUAs' business.

Pump Repairs and Other Water Management Equipment

- Most of the old land is irrigated by gravity during winter. The new reclaimed lands are irrigated by lifting. However, more than 90 percent of the old land is irrigated by lifting in summer due to water shortages and low water levels in canals.
- Water users have Peter brand diesel pumps from India, assembled locally. There are electrical pumps as well. What a farmer uses depends on availability
- Each pump irrigates about 3 feddans per day. The average cost per irrigation session is about L.E.10.
- Repairs may have to be made every 2–3 days.
- Problems are caused by shortages of spare parts, or non-standard spare parts used in repairs, or due to mechanic carelessness.
- Mechanics may not have appropriate experience.
- Users suggested establishing a workshop to serve a group of BCWUAs.
- Some farmers said that existing workshops do have good experience and farmers go there.
- New graduates may not have the experience to do adequate repairs.
- The project does not have the resources to furnish these workshops and stock them with spare parts.
- Sometimes farmers go to the workshop attached to the dealer where they bought the pump, but in most cases they go to mechanics not attached to the dealers.
- Spare parts are available; however, they are not standard so the repair may perform poorly and only for a short time.
- During the last year, farmers took pumps for repair an average of four times.
- On the Salamia Canal alone there are about 1,000 pumps.
- Establishment of a workshop for pump repairs might help improve service.

Business Management

- BCWUA members said that financial management is conducted by them.

- Farmers rely on their memory to manage their business. No farm books are kept, except on large farms.

Other Issues Related to BCWUAs

- The District Manager said he would meet with BCWUAs periodically, and asked that BCWUA boards arrange for regular meetings with BCWUA groups based on geographical area.
- The amendment of Law No. 12 will authorize the organization for active participation.
- Most of BCWUAs have already prepared office space; however, BCWUAs are still in need for funding to furnish offices.
- The water users requested an extension of training on internal regulations.