NATIONAL BEST PRACTICES REPORT
EGYPT
NBI / NTEAP / MGP
September 2009

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Acronyms and Abbreviations:

CBO	Community Based Organization
CSO	Civil Society Organization
NBI	Nile Basin Initiative
NGO	Non Government Organization

Acknowledgement:

The author of this report would like to thank the management of the Nile Basin Initiative (NBI) for availing this opportunity to participate in the technical assessment of the outcomes of the micro-grants projects. Also, the author would like to thank Mrs. Ithar Khalil, the NTEAP National Project Coordinator, Egypt, for her help and tremendous support during the preparation and execution of this assignment. The efforts made by Mr. Khalid Bayoumi, the Local Micro-grants Coordinator (LMC), Egypt, are so valuable in undertaking the technical assessment of some of the Micro-grants projects. It goes without saying that the author would also like to thank the head of the Qualitative Federation for Cultivation, Qena Governorate, and his crew members for their support given during the assessment. Finally, the author's sincere thanks and appreciation go to all that helped to make this technical review a successful task, particularly the broad beneficiaries.

Executive Summary:

The Nile Transboundary Micro-grants Programme is an initiative of the Nile Transboundary Environmental Action Project (NTEAP). The Regional Micro-grants Strategy has been developed in line with the NTEAP goal of piloting and demonstrating viable approaches to transboundary environmental challenges in the basin. In this context, the canal lining project is justified by the fact that the pre-project situation is characterized by a number of serious implications namely: (a) conflict between farmers on cleaning the irrigation canals; (b) loss of land on both sides of the irrigation canals due to surface run-off and weeds; (c) high salinity (d) high seepage losses of irrigation water; (e) air pollution ejected by the pumps (f) growth of weeds; and (g) high prevalence of insects and worms. The innovative nature of this project is four-fold: firstly, water conservation through impermeable lining of the conveyance system; secondly, improved on-farm practices; thirdly, improved agricultural production; and fourthly, a peaceful coexistence among villagers in the use of the resources.

The canal lining project demonstrates the efficient use of water resources in fragile ecosystems where consumptive use of water is seriously hampered by great seepage losses due to a poor conveyance system. Such value has not only branded the innovative nature of this project, but also rendered it attractive to the nearby villagers and the government alike. As a result of canal lining there was a significant reduction in the total quantity of irrigation water as well as time saved to farmers. Moreover, it has been reported that there is a 100% reduction of seepage losses at the conveyance system (lined canal) and before reaching the farm gate. Consumptive use of irrigation water has led to an additional cultivable land of 126.8 m2 by the side of the canal; previously being water logged and infested with weeds. Moreover, with the application of a better water management system and continuous repairs to damaged canals, the new design is expected to generate a reasonable quantity of annual saving of water. On the environmental front, reducing the irrigation time will reduce the fuel consumption by water pumps which will reduce air pollution and consequently reduce GHG emissions. On the social side, the beneficiaries acknowledged that the project created a general unity among them and further diffused the previously reported conflict and tensions on the divine use of water resources.

The fact that the project generated significant benefits indicates that it can be easily sustained. Key factors conducive to sustainability include high returns from crops, reduced cost of production, time saved, conflicts over land and water resources resolved and poverty reduced by engaging more poor farmers into the production process. Accrued financial, environmental and social benefits rendered the project more attractive to the nearby villagers and the government alike. It was reported that many villagers started right away to replicate the project using their own resources.

Environmental consequences of increased cultivable land, marketing risks pertained to increased production and rudimentary capacity in water resource management are the key challenges and limitations. As soon as farm products start to show a remarkable increase, a marketing strategy has to be put in place. Such a strategy necessitates the support of the Qena Governorate and the rural banking system.

Support and Development of the Traditional Handicraft Project is a successful income generation pilot initiative that revived an old heritance of a home-based technology that had almost faded out. The benefits it generated for both the women and the Community Development Association (CDA) rendered the project very attractive for replication in Egypt as well as in the other Nile Basin countries. The fact that the CDA designed and assembled its own looms entails that the technology can easily be maneuvered locally and hence can easily be sustained. In the long term perspective, the CDA needs to look into options to meet the increasing demand for handicraft products through establishing a revolving-fund mechanism which extends loans to beneficiaries in support of the home-based production systems.

Raising the Local Productive and Institutional Capacities to Protect the Environment Project is a simple and low-cost mean of helping communities in a sustainable manner, whereby their local NGOs will be able to address in situ problems once they acquire the right capacities. It is thus that the capacity support had an evident positive impact on the NGOs internal organization, ability to perform better, visibility and gaining the trust of the communities. It had also helped the Qena Union Federation in materializing its role as an umbrella NGO. The only limitation foreseen in considering replicating the project in other areas/countries might be the lack of strong expertise within the targeted area which, in such a case, entails that options for importing expertise have to be explored.

The Improvement of the Environmental Conditions for Irregular workers demonstrates how a major problem such as lack of sanitation and its associated negative social, environmental and health impacts can be averted in a low-cost and simple approach. It has benefited the environment, the poor people of the village as well as the implementing NGO and the community at large. The beneficiary contribution ensured their ownership of the units and the benefits they gained would eventually ensure sustainability of the project. Though this project is replicable elsewhere in Egypt as well in the other Nile Basin countries, albeit there is a need for an oversight specialized engineer. This warranted by the fact that the replication of such a project may need some modifications and/or adaptations of the unit design to suit the local conditions.

The Nile River Protection form Pollution by Solid Waste Project is a good showcase for means that can be adopted to ensure the success of projects of this nature. Such means have not only made it an innovative project, but also rendered it attractive to the villagers elsewhere in Egypt and other Nile Basin countries. The amelioration of the environmental, health and social problems, the mechanisms put in place by the NGO to maintain subscription rates and the revenue generated by the NGO ensured that the community members are interested in sustaining the project. The way the project management has exempted the poorest households from the fees offers a very good lesson for how the revenue-generation function of the project could be maintained while simultaneously social solidarity is fully considered. There have been some minor limitations that require minimal effort and time to overcome which mostly include technical assistance and inspection.

The project, Community Based Water Conservation is a good demonstration of improved farming practices that generate substantial financial benefits for the farmers while conserving natural resources. It is very replicable in Egypt and, as it is only a model for a good farming system, it is not sustainable per say, albeit its sustainability is rather seen within the context of its replicability. It is to be mentioned that leveling is done by complex equipment henceforth, replication can thus be difficult in countries where such expensive equipment is not available.

The hyacinth recycling project is one of the NTEAP school projects that aim at introducing project-based learning whereby schools are given the opportunity to practice environmental auditing, participate in solving the identified problems and collaborate with their communities through planning and managing activities to induce environmental improvements. The project is highly replicable in Egypt as well as in the other Nile Basin countries while the evident benefits of the project can easily ensure its sustainability. To overcome the problem of potential stopping after the depletion of water hyacinths in the area on the long run, the students were informed of some alternative raw materials such as the use of agriculture wastes instead of hyacinths.

The Environmental Canal Covering Project is a good example of how environmental problems can be solved in an innovative manner that also generates cultural and economic benefits within a village. It had a profound positive impact on the environment, created job opportunities, offered a good meeting place for women, children, and men and solved the financial and logistical problems traditionally associated with weddings. It is a self-sustained project whereby the revenue generated along with the community's interest will ensure its maintenance. As far as replication is concerned, the generated benefits render it attractive for replication in villages with a similar setting.

The project, Recycling of Banana Waste, well demonstrates how environmental problems can be solved in a simple manner that generates substantial income for the beneficiaries. The TOT approach which was adopted rapidly disseminated the technique among the farmers and has allowed the NGO to ensure its sustainability through renting out the shredder. It is a self-sustaining project whereby the revenue generated along with the community's interest will ensure its maintenance. As far as replication is concerned, the generated benefits of this project render it very attractive for replication in villages elsewhere in Egypt and other Nile Basin countries. In this respect, it is to be noted that this technique is applicable to all sorts of agricultural wastes. However, the change in composting material, and thus needed additives, might necessitate seeking advice from specialists.

1. Introduction:

The River Nile is one of the world's great assets and throughout history it supported various livelihoods, an array of ecosystems, unique diversities and rich cultures. Ten countries share the Nile: Burundi, Democratic Republic of Congo, Egypt, Ethiopia, Eritrea, Kenya, Rwanda, Sudan, Tanzania, and Uganda which all serve as a home for an estimated 300 million people. Despite the basin's natural endowments, its people face considerable challenges namely poverty, instability, rapid population growth, HIV/AIDS, environmental deterioration and water quality; to name only a few.

Agriculture represents the main livelihood in Egypt. For the majority of the Egyptians, agriculture is the main source of income, supports food security and provides a year round labour opportunity. Facing the rapidly growing population while simultaneously suffering from water scarcity, rural food security is presently at stake. In addition to that, some of the most important crops like rice and sugar cane consume huge quantities of water while Egypt is on the edge of water scarcity as the none increasing annual discharge from Nile water is 55.5 BCM which represents 97.5% of the country's total water resources (rain and groundwater). This situation does not only warrant an increase in the water supply capacity, but also the consumptive use and proper management of the existing irrigation systems at the command, the conveyance and the field levels.

The Nile Transboundary Environmental Action Project (NTEAP) is one of the eight projects under the Nile Basin Initiative Shared Vision Programs (SVP). The main objective of the project is to provide a strategic environmental framework for the management of the transboundary resources and environment challenges in the Nile river basin. The project specifically intends to: (a) improve the understanding of the relationship of water resources development and environment; (b) provide a forum to discuss development paths for the Nile with a wide range of stakeholders; (c) enhance basin-wide cooperation and environmental awareness; and (d) enhance environmental management capacities of the basin-wide institutions and the NBI. Operationally, the project has 5 components namely, Institutional Strengthening to Facilitate Regional Cooperation, Community-Level Land, Forest and Water Conservation, Environmental Education & Awareness, Wetlands and Biodiversity Conservation and Water Quality Monitoring.

In the above context, NTEAP has established major activities on the ground that have an impact on the environment of the basin, poverty and income generation and, as such, they remained significantly important to the NB countries. All these activities are implemented by the project in collaboration with government officials, communities, NGOs, CBOs, networks, school teachers and students.

The collective objectives of these activities are to pilot successful approaches to land and water conservation measures at the national level; raise awareness on the major environmental threats that face the Nile basin and enhance the technical cooperation among the NB countries.

In 2007, NTEAP embarked on a major exercise to identify, review, select and document techniques and processes that have the potential to be sustainably replicated and/or up scaled. In support of this process a regional workshop was held in Kigali in August 2007 in order to enhance the capacity of the National Coordinators in the identification and selection of the best practices in their respective countries. For Egypt a five-step selection approach was used to identify some projects that have the potential to be further disseminated as best practices. These steps can be listed as follows:

- Critical analysis of the on-going NTEAP projects, including the Micro-grants as well as the national environmental projects which were either completed or due to be.;
- Short listing of the projects that have passed the preliminary screening exercise;
- Setting of five selection criteria namely, sustainability, explicability, poverty alleviation, affordability and innovativeness with a final score range of 1 as lowest to 5 as highest;
- screening of potential projects based on the above merit scores; and
- Summarizing the results.

The results of the final sieving culminated into the selection of one best practice project in irrigation management through lining of the conveyance system in order to reduce severe seepage losses and further improve irrigation efficiency.

2. Best Practice Concept: Basic Definition

Generally, within the NTEAP, the art of best practice is defined as a visibly sustained impact of an innovative project/Programme brought about by a particular design, a technique, a process, a methodology and finally delivered with fewer problems and unforeseen complications.

Specifically, in environmental management, the concept of best practice is literally defined as the most efficient and effective series of outcomes that have proven desirable and further generate sustained impact, both on the resource base and beneficiaries. As such, they could be further replicated or up-scaled in similar ecosystems; advisably with a recorded multiplier value.

As a conduit for knowledge management, the best practice concept facilitates wide exchange of information, enhances trading of sustainable good operating systems" and promotes cross-border, transboundary and regional cooperation.

3. Best Practice 1: Environmental Consequences of Water Canal Lining

3.1 Problem Statement:

During the pre-project context, Qena Governorate villages were bracketed by a number of problems. These include, among others:

(a) Difference of schedules of irrigation times among farmers;

(b) Conflict between farmers on cleaning the irrigation canals;

(c) Loss of land on both sides of the irrigation canals (surface run-off and weeds)

(d) high salinity;

(d) High seepage losses of irrigation water;

(e) Air pollution ejected by the pumps;

(f) Growth of weeds; and

(g) High prevalence of insects and worms.

In order to ameliorate these problems, a fully participatory approach in project planning, design, implementation, management and evaluation has been followed.

3.2 Justification for Selection (innovativeness):

The canal lining project is justified by the fact that the pre-project situation is characterized by a number of serious implications namely: (a) conflict between farmers on cleaning the irrigation canals; (b) loss of land on both sides of the irrigation canals due to surface run-off and weeds; (c) high salinity (d) high seepage losses of irrigation water; (e) air pollution ejected by the pumps (f) growth of weeds; and (g) high prevalence of insects and worms. The innovative nature of this project is four-fold: firstly, water conservation through impermeable lining of the conveyance system; secondly, improved on-farm practices; thirdly, improved agricultural production; and fourthly, a peaceful coexistence among villagers in the use of the resources.

3.3 Technical Approach: Design and Methodology:

The project main strategy is four-fold: firstly, water conservation through impermeable lining of the conveyance system; secondly, improved on-farm practices; thirdly, improved agricultural production; and fourthly, a peaceful coexistence among villagers in the use of the resources. The project implementation was entrusted to the eleven corporate community development associations with direct support from the Ministry of Social Affairs. The community development associations played a vital role in giving direct support to farmers, following up on project implementation, advancing the role of women and helping to identify better marketing avenues for the agricultural products.

Plate (1): The canal lining layout

3.4 Partnership:

The main partners to the project include the community members, defined as direct beneficiaries, the corporate development associations, Qena Governorate and he Ministry of Social Affairs.

3.5 Essence of the Best Practices:

The essence of a best practice porject takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability. For the Animal Traction Porject these could be further elaborated as follows:

3.5.1 Benefits and lessons learnt:

As a result of canal lining there was a significant reduction in the total quantity of irrigation water as well as time saved to farmers. Moreover, it has been reported that there is a 100% reduction of seepage water at the conveyance system (lined canal) and before reaching the farm gate.

Consumptive use of irrigation water has led to an additional cultivable land of 126.8 m2 by the side of the canal; previously being water logged and infested with weeds. Moreover, with the application of a better water management system and continuous repairs to damaged canals, the new design is expected to generate a reasonable quantity of annual saving of water. Initially this project required an investment cost of 3,366 LE covering the value of the canal lining (2,366 LE) and production inputs of 1,000 LE. On the other hand, the total income gained from this projects adds up to 4,700 LE (crops:2,000 LE, energy saving:2,700LE). Therefore once the initial cost of canal lining is covered in the first year, the project will then generate a total income of 3,700 LE (equivalent to approximately 500 US$). It follows that the total payback period (3,366/4,700) x 12 is 9 months. This means that the pay back period for retaining the cost is less than a year, which indicates that implementing the project on a large scale will be highly successful. It is worth noting, that the estimated benefits above, do not account for the reduction in irrigation water, which would put more arable land into cultivation and hence engage more farmers into the production process.

On the environmental front, reducing the irrigation time will reduce the fuel consumption by water pumps which will reduce air pollution and consequently reduce GHG emissions. On the social side, the beneficiaries acknowledged that the project created a general unity among them and further diffused the previous frequent conflict and tensions on the use of water resources.

At the local level, these benefits have perpetuated a strong local demand for replication in other areas where several other farmers introduce irrigation canal lining using their own resources.

3.5.2 Sustainability:

The fact that the project generated significant benefits indicates that it can be easily sustained.

Key factors conducive to sustainability include high returns from crops, reduced cost of production, time saved, conflicts over land and water resources resolved and poverty reduced by engaging more poor farmers into the production process.

3.5.3 Replicability:

This project is a good demonstration of efficient use of water resources in fragile ecosystems where consumptive use of water is seriously hampered by great seepage losses. Such value has not only branded the innovative nature of this project, but also rendered it attractive to the nearby villagers and the government alike. It was reported that many villagers started right away to replicate this project using their own resources.

3.5.4 Limitations and Challenges:

Putting additional land into cultivation as the result of saving on irrigation water and time entails that the environmental consequences of increased production have to be addressed. This means that environmental conservation practices have to be put in place with rigorous monitoring at the field level. Moreover, with additional land being put under cultivation, a diversified pattern of production is needed in order to reduce risks of increased use of production inputs and tap more marketing avenues for the agricultural goods. Technical support to rural farmers to perpetuate their capacity in water resource management is instrumental to the sustainability of the project.

3.6. Conclusion:

This project is a good demonstration of efficient use of water resources in fragile ecosystems where consumptive use of water is seriously hampered by great seepage losses. Such value has not only branded the innovative nature of this project, but it also rendered it attractive to the nearby villagers and the government alike. The fact that the project generated significant benefits indicates that it can be replicated and easily sustained. Key factors conducive to sustainability and replication include high returns from crops, reduced cost of production, time saved, conflicts over land and water resources resolved and poverty reduced by engaging more poor farmers into the production process. However, in order to improve the design of similar projects, there should be more focus on capacity building in water resource management and conservation, diversification of crops, marketing and conflict resolution over communal resource use.

As soon as farm products start to increase, it means that a marketing strategy has to be put in place. Such a strategy necessitates the support of the Qena Governorate and the rural banks to the farmers' associations.

4. Best Practice 2: Support and Development of Traditional Handicrafts (EL Ferka EL Sodany – handy made carpets).

4.1 Problem Statement:

It has been estimated that 70% of the rural poor of Egypt reside in Upper Egypt. Qena, being one of the poorest governorates of Upper Egypt, is characterized by rampant and chronic poverty, particularly in the villages where most of the households are living below the poverty line, with an average income rate of US$ 320 per annum. This, combined with a high unemployment rate, heavy reliance on the week agriculture sector for employment, and limited opportunities for job creation, make horizons for potential improvement too narrow.

On the other hand, Negada city in Qena Governorate was once famous for its hand-made cloth- known as El Ferka. This was historically very popular in the city up until the 1970's, with most of the produce being exported to Sudan. Almost 70% of the houses of the city had the traditional Ferka weaving looms, (in which the woman had to sit in a pit in the ground to operate it). However, as the Sudanese marketing opportunities diminished over time, this handicraft rural industry also started to slowly fadeout in Negada. Most of the ladies abandoned their looms, while the produce of the very few (less than 10), who continued to work, was monopolized by one merchant- buying their produce at very low prices. With the objective to ameliorating the problems pertinent to poverty and the gradual fadeout of the handicraft industry, this project was designed both to revive this work and ensure income generation in support of the poor households of the city.

4.2. Justification for Selection (innovativeness):

This project innovativeness lies in the fact that it revived rural self employment in a sustainable manner while simultaneously recurred a traditional handicraft industry that the city was once renowned for, albeit has almost died out with time. The new thing here is that modern loams had been replaced by locally made ones at 50% less cost.

4.3 Technical Approach: Design and Methodology:

The project main strategy is three-fold: firstly, building the capacity of a local NGO to be the house of expertise of El Ferka handicraft in the city; secondly, modifying the traditional looms so as to avoid the health problems associated with sitting in a pit in the ground; and thirdly, empowering poor women through training on the handicraft techniques and marketing their products.

The project implementation was entrusted to El Shabat El Moslimat Community Development Association (CDA) in the city. It bought the looms, trained the women, marketed their products and created a center for training of additional women candidates.

Plate (1): The loom in use

In addition to getting to know and practice the basics of the Ferka production, the beneficiaries were also trained in advanced techniques that allow them to produce more ornate products including defect detection, double face production, dyeing, color matching, depiction design, etc. The duration of these training modules ranged between 3 days for defect detection and 22 days for quality assurance. The cost of the models varied between 1000 LE to 5100 LE each, with the dyeing models being the highest owing to the cost of natural pigments used.

4.4 Partnership:

The main partners to the project include the community members, defined as direct beneficiaries, the Shabat El Moslimat CDA, the local administration and the private sector.

4.5 Essence of the Best Practices:

The essence of a best practice project takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability. For this project these could be further elaborated as follows:

4.5.1 Benefits and lessons learnt:

As a result of the project, 24 women were trained on Ferka handmade production. The best 10 of these were retained in the NGO to: (a) train more women; and (b) produce Ferka products for sale. The CDA buys this product at a rate of 1.5 L.E. per piece, thus providing an average income of 400 LE/ month for the women, and then sell it with a reasonable profit margin, thus generating revenue for its own sustainability. The other benefits include the increasing visibility and demand for this product, whereby the CDA is requested to participate in more and more exhibitions countrywide. They foresee that their next step shall be to find international avenues for marketing their products.

Other unintended benefits included: firstly, the twining agreement made with the Industry Modernization Agency of the Egyptian Federation of Industries (IMAEFI) where under this agreement, the Agency provided financial support for more training and exhibitions; and secondly, the two offers received by the CDA to train for the Business Incubators Programme organized by both the Social Fund for Development (SFD) and the Ministry of Solidarity (MS).

Plate (2) Products of the Beneficiaries

According to the CDA, the success of the project was the key factor that attracted the Social Fund, the Ministry of Solidarity and the Federation of Industries, encouraging them to cooperate with the CDA and build on the achieved results. It is worth noting that the CDA became fully competent in the use of the looms and their operational mechanism.

After the first batch of 6 looms was procured from Cairo, the project manager was able to design and assemble a loom locally. While the Cairo looms were purchased at 1500 L.E. the modified loom was constructed at a cost of 1000 L.E. hence, reducing the inputs for the loam by 50%.

4.5.2 Sustainability:

The fact that the project generated significant benefits indicates that it can be easily sustained. Key factors conducive to sustainability include the income generated for both the women and the CDA, the increasing demand for the products and the potential market for the CDA as a training service provider. It is to be noted that the TOT approach adopted by the project, does not only ensure its sustainability, but also its expansion.

4.5.3Replicability:

This project is a good pilot for income generation in poor communities, that are found everywhere in the Nile Basin. The success achieved had attracted more and more women in the city to participate in the project's activities. It has also attracted stakeholders from other areas of the country to join hands with the CDA. It is thus anticipated that such a project can be very encouraging to other CDA in Egypt as well as in other Nile Basin Countries to replicate. Moreover, the ability of the CDA to master the mechanism of loom operation and design its own indicates that know-how is commendable and the project replication is not very difficult.

4.5.4Limitations and Challenges:

According to the CDA, it was rather difficult for them to find trainers at the start of the project. The very few people who mastered the Ferka handicraft in the city were uncooperative, wanting to maintain this skill within their own circle. The CDA thus had to seek trainers from Faculties of Applied Arts which was not an easy task. However, now with the women trained by the project, training is now easily obtainable and can not be monopolized. It is also worth mentioning that the CDA needs to put a strategy for up-scaling in place. That is to say, with an increasing number of interested women, the CDA should look into options for meeting this demand. With only 6 looms owned by the CDA, the capacity of the CDA will remain limited. That said, the strategy to be adopted by CDA is thus three-fold: firstly, strengthening its role as a service provider where a revolving fund mechanism is established to offer loans for beneficiaries to procure looms and operate from home; secondly, engage in marketing where it is to collect women's produce and market it on their behalf; and thirdly, provide training services to other agencies such as the Social Fund, Ministry of Solidarity and other relevant entities.

4.6. Conclusion:

This project is a successful income generation pilot project that revived an old heritance of a home-based handicraft technology that had almost faded out.

The benefits it generated for both the women and the CDA rendered it very attractive for replication in Egypt as well as in the other Nile Basin countries. The fact that the CDA designed and assembled its own loom indicates that the know-how is easily mastered and thus the whole project is replicable as far as the technicalities are concerned. This entails that the technology can easily be maneuvered through local manufacturing of looms instead of importing them. As with regards to sustainability, this is ensured by the revenues generated, which triggers the interest of many people to join the project.

As a long term strategy, the CDA needs to look into options to meet the increasing demand and marketing of due products. This might entail establishing a revolving-fund mechanism within CDA to provide loans for beneficiaries in support of home-based production systems.

5. Best Practice (3): Raising the Productive and Institutional Capacities of Four Community Development Associations (CDAs) to Protect the Environment.

5.1 Problem Statement:

It is recorded that there are more than 20,000 NGOs registered in Egypt. Ideally, all such organizations should be working to support the government in its service delivery role. However, it is noted that capacities within and outputs from these NGOs vary substantially, ranging from very strong ones with evident achievements to very weak ones that are only registered on paper. In between such an array, there are NGOs that have good intentions and evident willingness to deliver services, but are constrained by their weak capacities and capabilities. Performance of such NGOs would substantially improve if they are institutionally supported. The above project was primarily designed to raise the capacities of four of these NGOs, thus increasing their potentials to deliver services.

5.2 Justification for Selection (innovativeness):

This project innovativeness lies in the fact that it builds capacities of weak NGOs through locally available human resources and capacities of stronger NGO peers the area. It also sheds more light on the benefits that can be gained from close association of NGOs under an Umbrella Federation that can extend support to weak ones.

5.3 Technical Approach: Design and Methodology:

The capacity support project was designed to achieve two main objectives: firstly, to build the capacities of weak NGOs through the transfer of knowledge and experiences from stronger NGOs in the area and; secondly, to create and further strengthen a local Union Federation as an umbrella NGO that supports its weak members. The core activities include (a) undertaking of an institutional analysis for the entire federation member NGOs to identify the weakest four; (b) building the capacity of the selected NGOs in good governance (a three days module), strategic planning (a 3 days module), Participatory Rapid Appraisal (PRA, a 7 days module), proposal writing and fundraising (3 days module) and project management (a 3 days module); (c) procurement of equipment and furniture for the target NGOs. All the trainings were undertaken by members of the Environmental Union Federation where five members from each of the 4 NGOs participated in the trainings and the budget of each module was in the range of 1,700-2,500 LE.

It is to be noted that the project was designed to give the NGOs the opportunity to apply the training they got. Thus, after the strategic planning module, each NGO was given the chance to put its 5 year strategy. Similarly, after the good governance module, each NGO developed its internal bylaws and after the PRA and proposal writing modules, each NGO undertook a PRA in its village and developed a proposal to address the identified problems accordingly. This proposal was then funded by the project and implemented by the NGO, as an on-job training in project management.

5.4 Partnership:

The main partners to the project were the Qena Environmental Union Federation, the local CDAs and communities in El Makhadma, Dandara, Zawayda and El Sanabsa villages.

5.5 Essence of the Best Practices: Benefits and lessons Learnt:

The essence of a best practice project takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability. As with regards to this project, the weakest four member NGOs were trained and there was an evident improvement in their structuring and performance. Some of them hade been established since the 80's, but had been since then functioning without a clear vision of what they want to achieve and the modalities of achieving it. Moreover, they were functioning without a clear administrative structure. For the first time, and through the project, they were able to plan and set their own agenda in a strategy that would guide their work for the next five years.

The developments of bylaws under this project put the institutional structure of each NNGO in place, including the establishment of a strong board of directors and general assembly, regulated their functioning and improved their performance. Along these lines, it was reported that their improved understanding of good governance had positively impacted their board formulation in terms of representation e.g. they increased the numbership of female and Christians. The project has also positively impacted the ability of the NGO to identify local problems and address them. In the case of El Maghadma NGO, for example, this project had enabled the NGO to go beyond the traditional work of Quran citation and orphan support into more complicated unprecedented service delivery.

Plate (4): Public Garden for Children, EL Makhadma Village.

As an indirect result, the improved performance of the NGOs had also resulted in improving their visibility and building the trust of the community members in their abilities to do work. This was translated in an increase in the general assembly membership as well as an evident increase in donations they received from the community. In general, it could be concluded that this project had evidently strengthened the linkages between the NGOs and their communities and gave them a common platform to understand their local problems and join hands to address them. As an evidence of improved proposal writing and communication skills two of the NGos were also able to raise funds from donors.

Plate (5) Evacuation Tractor, one of an Environmental Intervention in EL Zawida Village.

Finally, this project had supported the Qena Environmental Union Federation to fulfill its role as an umbrella NGO that further strengthen weak members. As confirmed by many members from the Federation, such generated ability had increased the satisfaction of the member NGOs and their believe in the added-value of being a member in the Federation.

5.5.2 Sustainability:

The project sustainability lies in the significant benefits it generated, namely the built capacities of the NGOs. The successes that they hade achieved would maintain a vested interest among the NGOs to continue utilizing future avenues intended for capacity building. Seen from another angle, this approach of empowering communities through building their local NGO capacities to serve better is undoubtedly sustainable in terms of service delivery. In other words, building the capacity of an NGO and the community's trust in it would enable such an NGO to implement more and more projects, thus continue to serve its community in a sustainable manner.

5.5.3Replicability:

This project was designed to rely on local expertise and transfer of knowledge and experiences from stronger NGOs to weaker ones within the same geographical area. This approach is easily doable elsewhere in the country as well as in other countries. It is easily replicable in terms of simplicity as well as low financial needs.

5.5.4Limitations and Challenges:

The only limitation foreseen in considering replicating the project in other areas/countries might be the lack of strong expertise within the targeted areas.

In such a case, options for importing expertise have to be looked into taking into account the potential associated problems such as additional costs involved or language barrier.

5.6 Conclusion:

This project is a good example of empowering communities through building their local NGO capacities to serve better. It is thus a simple and low-cost means of helping communities in a sustainable manner, whereby their local NGOs will be able to continue addressing in situ problems. The capacity support had evident positive impact on the NGOs internal organization, ability to perform better, visibility and gaining the trust of the communities. It had also helped the Qena Union Federation in materializing its role as an umbrella NGO. The only limitation foreseen in considering replicating the project in other areas/countries might be the lack of strong expertise within the targeted area. In such a case, options for importing expertise have to be explored.

6. Best Practice (4): Improvement of Environmental Conditions for Irregular Workers in Nage El Awary Village- Qena.

6.1 Problem Statement:

Like most villages of Egypt, Nage El Awary has no governmental sanitation services. Most of the houses rely on closed septic tanks that have to be emptied 2-3 times each month. However, the poorest households do not even have this luxury. The less- poor of them has a pit latrine which they empty every 3 months. The majority of the poor, however, do not even have that. They have to simply defecate outdoors in the hidden surroundings of the village. Women have to wait until it is dark before they can do so, and consequently many of them have urinary tract and kidney problems. Most of them also have to take shower either in the nearby canal or in their neighbors' bathing sheds. This project supported the poorest of the poor households through construction of low- cost sanitation units to ameliorate their health, social and environmental problems they cause in their homes and in the village at large.

6.2. Justification for Selection (innovativeness):

This project was selected because it pilots low-cost sanitary units at the village level. The need for such unique designs endemically exists in all villages in Egypt as well as in other Nile Basin countries.

6.3 Technical Approach: Design and Methodology:

The project strategy is three-folded: firstly, it is to help the poorest households in the villages; secondly, it is to pilot a low-cost sanitation model that can be replicated elsewhere; and thirdly, it is to ensure beneficiaries' ownership through either in cash or in kind contribution. The Women's NGO of Nage El Awary implemented the project. To ensure objectiveness and transparency, the NGO announced the criteria for selection of beneficiary households. They also contracted the consulting engineer to design the units and supervise the construction work which would be done by a contractor. They administered the activities and undertook awareness sessions and home visits in the village to help the villagers use the new unit. Beneficiaries were expected to undertake the excavation works of the unit as a contribution to the project. Some paid for this, while those who were financially incapable, did the excavation manually themselves. A total number of 51 units were constructed where the cost of materials and labour for each unit was 2,178 L.E.. The consultant engineer charged 1900 L.E. for his work in the project as a whole.

Plate (6): The Unit Scenery at the Ground Level.

Plate (7): the latrines connected to the unit

6.4. Partnership:

The main partners to the project are the Women's NGO of the village, the consultant engineer, the contractor, the villagers and NTEAP.

6.5. Essence of the Best Practices: Benefits and lessons learnt:

The essence of a best practice project takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability. The benefits gained from the project were on several fronts. Firstly, on the environmental front, members of the benefiting households ceased to pollute the environment with their human waste. It is reported that this had reduced the flies and mosquitoes and their associated health problems in the village. It was also believed to ameliorate the health problems faced by the women not being able to defecate when needed, however there was not officially recorded as a positive health impact. Secondly, on the social front, this intervention had boosted the self-esteem of the benefiting poor. Instead of intruding on neighbors or sneaking to defecate, they now and for the first time have their own facilities and liberty to do what they need to do at their discretion.

The NGO had also benefited from the project by changing the community's perception of it as a women- serving NGO to a more wider scope by serving the whole family including men, youth and children. As explained by Ms. Hoda El Awary, the Chairperson of the NGO, all segments of the community members now approach them for support, not just the women. The NGO improved visibility induced by the project had also built the community confidence in it, hence increased community participation in the services provided.

Ms. Hoda also explained that the project had benefited the community as a whole by strengthening its pro- activity in solving problems. Community members are now more confident that problems could be solved through holding joint consultative meetings with decision makers to come up with solutions.

6.5.2 Sustainability:

The project is sustainable because of the benefits reaped by the community, which encouraged them to invest both the physical efforts and financial resources needed to maintain the units.

6.5.3 Replicability:

This project was designed to pilot a low-cost sanitation technique. Its generated benefits, on the one hand, and its nominal cost compared to tradition aerated sanitation systems on the other, make it very attractive both to communities as well as concerned government entities.

6.5.4 Limitations and Challenges:

The limitation of the project is in the casual design of the unit, which might not be the universally optimal type. Naturally, determinants such the soil conditions, availability of land and groundwater level, determine whether this particular design is applicable in any one area or not. This limitation can be addressed by having a specialized engineer to overlook the project. He/she should be able to decide on the appropriateness of the design within the project setting, suggest modifications/adaptations if need be, or in extreme cases select an alternative design of a low-cost unit.

6.6 Conclusion:

This project is a good demonstration of how a major problem such as lack of sanitation and its associated negative social, environmental and health impacts can be averted in a low-cost and simple manner. It has benefited the environment, the poor people of the village as well as the implementing NGO and the community at large. The beneficiary contribution ensured their ownership of the units and the benefits they gained will ensure that they avail the efforts and financial resources needed to maintain them, thus ensuring the project sustainability. This project is replicable elsewhere in Egypt as well in the other Nile Basin countries. However, there is a need for a specialized engineer to overlook the replication of such a project as the unit design may need modifications /adaptations to suit the local project conditions.

7. Best Practice (5): Nile River Protection from Pollution by Solid Waste and Wastewater in Wadi Abadi Village- Aswan:

7.1 Problem Statement:

As most of the villages of Egypt, Wadi Abadi Village in Edfu District of Aswan Governorate suffered lack of proper sanitation and solid waste collection services. Accumulation of solid waste in the village caused an array of environmental and health problems among the citizens, particularly the evident spread of disease vectors such flies, mosquitoes and rodents. Social problems also aroused in the form of feuds among villagers accusing neighbors or adversaries of disposing of waste in their land or in front of their homes. As for the wastewater, villagers typically relied on renting trailers from the nearby village to empty their septic tanks on needs basis. However, it was noticed that the rented trucks illegally emptied its contents in the nearest water course, creating a major environmental problem within the village. It is therefore that this project was primarily designed to solve the environmental, health and social problems resulting from lack of solid waste management and poor sanitation services.

7.2 Justification for Selection (innovativeness):

The selection of this project is justified by the fact that: (a) the solid waste collection component is very successful, which is not the case with similar endeavors implemented elsewhere; and (b) the collected wastewater is innovatively used to generate income for the implementing NGO.

7.3 Technical Approach: Design and Methodology:

The project was designed to deliver two services within the village namely, solid waste management and wastewater collection. As with regards to the solid waste management, a 3X3 M trailer was procured and mounted to the NGO's tractor. It collects waste from 850 households on a weekly basis at a charge of 2 L.E. per month. According to the NGO members, this is 96% coverage of the households of the village. There are 25 households (households relying solely on the Solidarity pension of 70 L.E./month) exempted from the fee. A driver and 2 workers operate this service and the waste is disposed of in a designated desert landfill 3 Km outside the village. In order to ensure the household subscription in the project- and thus its revenue and sustainability, the NGO strategy to that effect is two-fold: Firstly, it issues penalties for solid waste disposal within the village boundaries through the Local Unit. Households would then be left with three options to (a) dispose of their waste in the village and pay the associated fine; (b) carry their wastes outside the village with all associated efforts and time; (c) subscribe with the project.

It follows that most of the households opt for the third option. Secondly, as a mean of controlling subscription, the NGO uses its authority as the subsidized bread distributor in the village whereby they declared subscription in the waste project as a requisite for bread access.

For the wastewater collection component, a closed 3X3 M trailer was procured and also mounted to the NGOs' tractor. The collection is done on a needs basis, whereby households call the NGO to empty their septic tanks as needed. On average, ten such calls are received daily and the charge is 15 L.E. per trailer capacity. Similar to the practice in the solid waste component, the trailer capacity is taken 3 km away in the desert. There, a simple low-cost treatment unit composed of two tanks in series has been constructed to treat the water. The discharge of the unit is used to irrigate a small forest of 500 seedling of Sweitinia Mahogany trees planted as a long term investment for the NGO. These trees are currently less that one meter high, however within 10-15 years time each tree is expected to be 20-30 meters in height. The mature trees are sold for timber at a rate of 20,000 L.E. per tree.

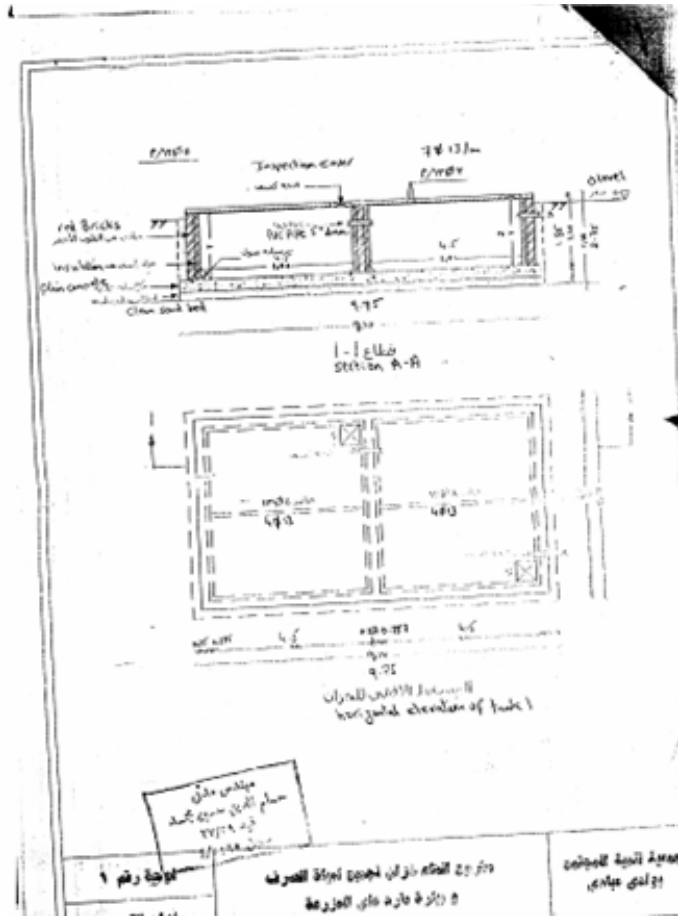

Plate (8) Design of First Tank

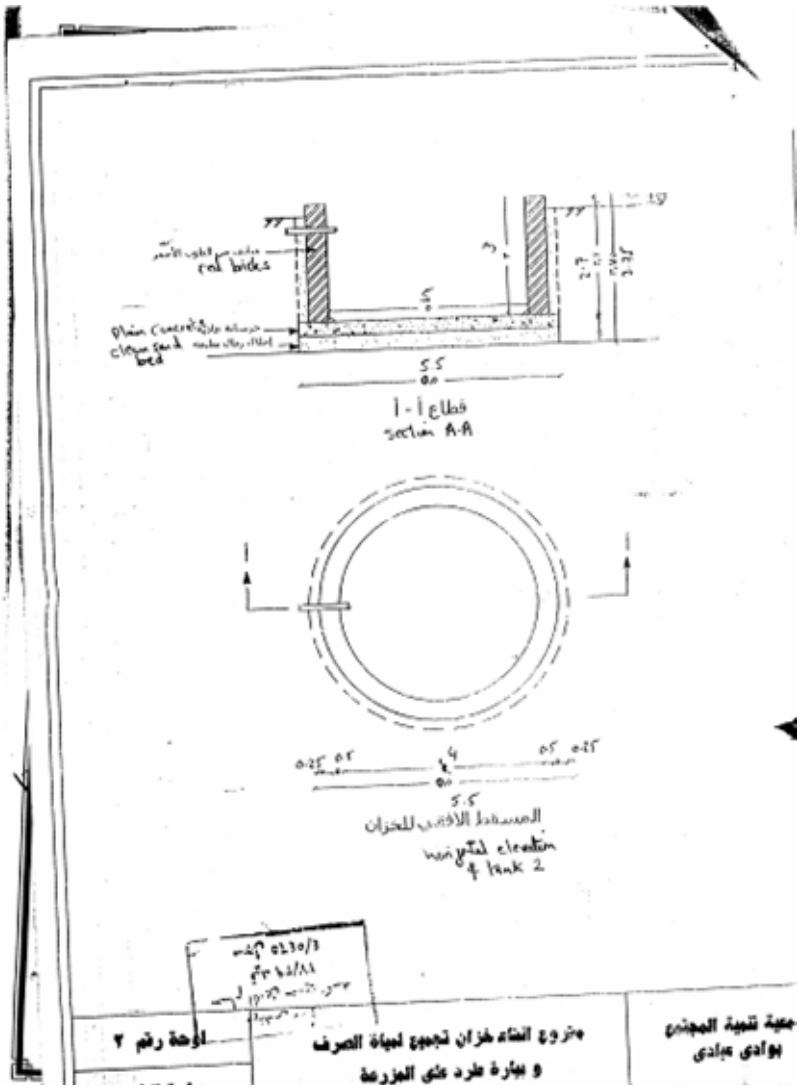

Plate (9): Design of the Second Tank

Plate (10) the Tractor, Trailer and the First Tank Seen from the Ground Level

Plate (11) Pumping Water from the Second Tank to the Forest

Plate (12) Tree Irrigation in Process

Plate (13) General View of the Woody forest

It is to be mentioned that the unit was constructed for 20,791 L.E. and the cost of plantation was L.E. 40,020, including the cost of the trees which was 5 L.E. per tree.

7.4 Partnership:

The main partners to the project include the community members, defined as direct beneficiaries, Wadi Abady community development association, the Local Unit, the Ministry of Social Affairs and NTEAP.

7.5 Essence of the Best Practices: Benefits and lessons learnt:

The essence of a best practice porject takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability. The benefits of the solid waste management component include the typical amelioration of the environmental, health and social problems associated with the unattended waste and poor sanitation.

In terms of lessons learned, this project was a good showcase for the successful management of similar projects. While many similar projects have failed due to low subscription rates and thus insufficient revenue generation to sustain operation, this project offered some lessons on how such a problem can be effectively addressed. Firstly, were the strong partnerships with official entities such as the Local Unit which indirectly compelled subscription through penalties for non-subscribers. Secondly, was the notion of linking subscription to getting access to another vital service or commodity that most, if not all the village households, need. Lastly, the way the project management exempted the poorest households from the fees also offered a very good lesson for how the revenue generation function of the project is maintained to ensure its success while social solidarity considerations are put in action so as not to overburden the small percentage of incapable households.

As for the wastewater treatment component, there were also good lessons to be learned. Instead of traditionally discarding wastewater in isolated areas, the NGO offered a good demonstration of how this water could be used as a resource in long term investments. In addition to their monetary value after some years (20,000 L.E. per tree) , these trees also have positive environmental impacts on their vicinity by increasing the green cover. 20,000 L.E. per tree.

7.5.2 Sustainability:

The amelioration of the environmental, health and social problems as well as the mechanisms put in place by the NGO to maintain subscription rates ensure that the community members are interested in sustaining it.

On the other hand, the revenue generated by the NGO ensures that their interest in running the project is maintained and also avails the financial needs for sustaining it. It is to be noted that the NGO has taken into account the depreciation of the equipment and has thus been retaining a portion of the revenue aside for replacements in due course.

7.5.3 Replicability:

This project is a good showcase for some of the means that can be used to ensure success of projects of this nature. Such means have not only rendered it an innovative project, albeit made it attractive to the villagers elsewhere in Egypt and definitely would be the case with other Nile Basin countries. It can also be adopted by government entities who might operate it instead of the NGO.

7.5.4Limitations and Challenges:

The main limitations include the plantation of some vegetables such as tomatoes and onions in the forest established by the wastewater. These plantations grow from seedlings coming in the animal manure used for fertilizing the land. Although they were seen in very small quantities, such products can cause potential health hazards if consumed by the villagers. It is thus necessary to instruct that all edible plantations are to be removed on a regular basis and that warning signs are to be posted in the forest area so that pedestrians do not consume any of the products that may be there. Moreover, mosquito maggots were seen in large quantities on the surface of the second treatment tank, causing potential health problems in the area. Operators of the unit were advised that this could be overcome by adding a small quantity of gasoline in the tank to create a non-permeable film on the surface. The resulting lack of air (oxygen) would exterminate these larvae.

7.6. Conclusion:

This project is a good showcase for means that can be adopted to ensure the success of projects of this nature. Such means have not only made it an innovative project, but also rendered it attractive to the villagers elsewhere in Egypt and other Nile Basin countries. The amelioration of the environmental, health and social problems as well as the mechanisms put in place by the NGO to maintain subscription rates, ensured that the community members are interested in sustaining it. On the other hand, the revenue generated by the NGO ensures that their interest in running the project is maintained and also avails the financial needs for sustaining it.

The way the project management has exempted the poorest households from the fees also offers a very good lesson for how the revenue-generation function of the project is maintained to ensure its success while social solidarity considerations are put in action so as not to overburden the small percentage of incapable households. There have been some minor limitations that require minimal effort and time to overcome. However, these limitations revealed that such a project needs technical assistance and/or inspection, at least, from time to time.

8. Best Practice (6): Piloting Community Based Water Conservation through Innovative Techniques to Increase Irrigation Water Use Efficiency in Sugar Cane Plantation in Egypt:

8.1 Problem Statement:

At present approximately 85% of the water resources in Egypt is potentially used in agricultural irrigation. With the constant increase in population, the rationalization of water use will become a must to meet the rising demands for agricultural products and consequently water supply. Thus the immediate need to increase irrigation efficiency is of the highest national priority, now and even more in the future.

Sugar cane is the second highest water consuming crop cultivated in Egypt after rice. It consumes an average of 19,000 cubic meters of water/feddans[1] annually, compared to an average consumption of 7,000-10,000 m3 for other crops. Whereas rice cultivation is now being limited by governmental laws as a measure to reduce irrigation water consumption, there are no legislations or enforcements to control sugar cane growth. In fact, it is rather not possible to enact such regulations due to the historic nature of this cultivation and the associated large scale local sugar factories that provide an income to more than 20,000 households in their vicinity. There are approximately 300,000 feddans of cane cultivated nationally, consuming an average of 5,700 million cubic meter of water annually. Of those, approximately 23,000 feddans are grown in the southern part of the country, mainly in Aswan and Qena, where the high temperature is optimal for its growth. The main objective of this project is to pilot community based water conservation through innovative techniques that are meant to increase irrigation water use efficiency in sugar cane production in Egypt.

8.2 Justification for Selection (innovativeness):

The selection of this project is justified by the fact that it pilots and promotes new techniques to decrease water use in cane production and as well enhances irrigation efficiency.

[1] 1 feddan= 0.42 hectare

The approach is two-fold: firstly, to test a product of research whereby new varieties of cane produced by the Agriculture Research Center are piloted; and secondly, to introduce improved farming practice of land leveling. Building on these two innovative techniques, awareness is raised through demonstrations, awareness sessions, workshops and production and dissemination of awareness materials.

8.3 Technical Approach: Design and Methodology:

The water conservation project addressed an important problem in Egypt, namely the pressing need to rationalise efficient water use in agriculture that usually utilises 85% of the water resources of the country. In this context, it piloted community- based innovative techniques to reduce the intake of one of the highest water- demanding plantations- the sugar cane. This was done in an integrated manner that involved:

- introducing laser land levelling as a means for improving the characteristics of the soil, thus reducing its water intake. This was piloted in 125 feddans with an average of 3 hours and at cost of 180 L.E. per feddan. The levelling was done to create a slope of 20-10 cm/ 100 m;
- piloting the plantation of modified crossbreeding varieties of the plant with a reduced water demand. Three new cane varieties (EI 264-2, EI 266-2 and EH 16-6) were planted in 20 Feddans. These varieties are characterised by a maturation period of 10 months as opposed to the 2-months maturation period of the traditionally used varieties (GT 54-9, commercially known as C9).
- raising awareness of cane farmers of the techniques and benefits of reducing irrigation water. This was done through field demonstrations, awareness sessions, workshops and production and dissemination of awareness materials.

The implementation of the project was undertaken by El Awadalab CDA.

Plate (14): A laser leveled Plot of Land

8.4 Partnership:

The main partners to the project include the village cane farmers, Awadalab CDA, the Agriculture Research Institute and its organs in Aswan, Qena and Cairo, the Cane Farmers Association in Aswan and the NTEAP.

8.5 Essence of the Best Practices: Benefits and lessons learnt:

The essence of a best practice porject takes into consideration three key issues namely, accrued benifits and lessons learnt, sustainability and replicability. The benefits of the land leveling component of the project enhanced the conservation of water, reduced the water consumption from 19,000 m3 to an average of 10,000-11,000 m3/feddan annually and the time used in irrigation had been reduced from 6 to 3 hours per feddan, creating an average saving of 50% per feddan in the use of gasoline (L.E 30). It was also found to significantly increase the annual crop yield from an average of 34-45 tonnes of cane/ feddan to 42-49 tonnes through reducing pest, grass and fungi growth that are associated with excessive water supply and logging. Along these lines, there was also a reduction in the fertilizer consumption from 15 to 10 bags (50 kg each) of fertilizer. At a rate of L.E 80/bag, the saving amounts to L.E.400 per feddan. The reduced grass growth has also generated a saving of L.E300 in the weeding process. In addition, it was reported that there was a saving of L.E. 1000/feddan in the pre-cultivation land preparation process. It is evident that water logging in the field reduces water intake by the plants henceforth, negatively affecting the sugar content of the crop. Thus, land leveling is in one way or another believed to increase the sugar contents of the crop, though there are no documented statistics to support this hypothesis.

As for the benefits of cultivation of the new varieties, it is to be mentioned that no conclusions can be drawn at this stage as the cultivation was done in April 2009. With a crop a maturation period of 10 months, quantification of actual benefits will not be possible before February- March 2010. However, it is to be noted that the research of the Agriculture Research Center recorded a significant saving of water per feddan in irrigation water consumption.

8.5.1 Sustainability:

The sustainability of the project is very much linked to its replicability. What NTEAP has done was a pilot to demonstrate the benefits of land leveling and utilization of the new varieties in preference to the traditionally used ones. It is rather a model that should meet its full objectives within a duration of one year- and thus is not meant to persist everlastingly per say. Rather, its sustainability would be seen through the increase in number of farmers adopting these new farming practices - until a day comes when they become the norm.

8.5.2 Replicability:

As indicated above, the replication of this project is a key element in evaluating its success and 'sustainability'. In the case of land leveling, it was very positive to note that farmers already started replicating from their own resources.
The major success of this component made the proponent request for a second phase in which a new batch of 75 feddans are to be leveled. At the time of visiting the project, the proponent had a waiting list of 150 farmers wishing to level their lands, with this number being continuously on the rise.

As for the cultivation of the new varieties, it is difficult at this stage to predict replicability trends- that will naturally be dependent on the success on these varieties and the benefits gained from their cultivation.

8.5.3 Limitations and Challenges:

The main limitation pertaining to the project was the reluctance of farmers to pilot the new varieties. As this is an annual crop, they feared that in case the varieties failed, they will have no income for a whole a year. To overcome this, the proponent had to target the relatively prosperous farmers with big land tenure, requesting them to pilot in small plots of their land. In case of failures, these farmers would still have revenue of the remaining land as well as their other sources of income. It is to be mentioned that leveling is done by complex equipment own by the Ministry of Agriculture for lease to farmers upon request. It is available country-wide, thus replication within Egypt is easy.

8.6 Conclusion:

This project is a good demonstration of improved farming practices that generate substantial financial benefits for the farmers while conserving natural resources. It is very replicable in Egypt and, as it is only a model for a good farming system, it is not sustainable per say, albeit its sustainability is rather seen within the context of its replicability. It is to be mentioned that leveling is done by complex equipment. Replication can thus be difficult in countries where such expensive equipment is not available.

9. Best Practice (7): Recycling Hyacinth in Isna Highschool for Girls, Qena Governorate:

9.1 Problem Statement:

As is the case with all barrages, the water behind Esna Barrage offers a good environment for the nourishing of water hyacinths that create an array of social, economic and environmental problems. Firstly, these hyacinth waste excessive amounts of water as every Hyacinth plant wastes nearly 3 liters/day of Nile water through evaporation. Secondly, hyacinth is known for disrupting naval navigation and fishing activities, hence negatively affecting income of surrounding inhabitants. Thirdly, hyacinth provides a place for bilharzias shells to aggregate. Fourthly, hyacinth is a good absorber of heavy metals from the water making it poisonous for cattle and fish feeding on it, and consequently harming humans.

Though people in Esna suffered from the above mentioned problems of hyacinths, yet they lack knowledge of how to deal with such a nuisance plant. This project aimed at introducing innovative means to ameliorate this problem through a local school, whereby students get the opportunity of applying the concept of project-based learning in helping their community.

9.2 Justification for Selection (innovativeness):

The hyacinth project was selected because: (a) it promoted the sense of environmental protection among the students; (b) generated income for the school; and (c) offered the opportunity for the students to participate in ameliorating the problems within the domain of their community. The success achieved by the project was thus on several fronts, making it innovative in its own way.

9.3 Technical Approach: Design and Methodology:

The Esna School project for recycling Hyacinth is one of NTEAP school projects that aim at introducing project-based learning whereby schools are given the opportunity to practice environmental auditing, participate in solving the identified problems, and collaborate with their communities through planning and managing activities to induce environmental improvements.

The girls' school identified the prevalence of hyacinth in their area as the most pressing environmental problem that they would like to address through the project. As much as they wished to have a positive role in solving this problem, they lack ideas of how they could do so. The project was thus designed to import expertise from an NGO working in this field from Cairo. Four practitioners were brought to extend appropriate training for a total period for just more than a day. A total number of 25 girls were trained in the process of utilizing water hyacinths in paper production and thereafter on manufacturing paper products such as notebooks, paper-made lamps, wedding invitations, envelopes, gift bags and pyramids miniatures. The budget of the project was 2000$ with 6000 L.E. for the supplies and remaining 5000 L.E. for trainers' honoraria and travel allowances.

Plate (15) The Final Product

To assess the market value of the products, a promotional visit was undertaken to a nearby Bazaar where the owner expressed willingness to buy the products at almost 3 times their actual cost of production.

9.4 Partnership:

The main partners of the project include the school administration, the students and art teachers, trainers from El Nafitha Association in Cairo and NTEAP.

9.5 Essence of the Best Practices: Benefits and lessons learnt:

The essence of a best practice project takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability.

The benefits of the project were on several fronts. Firstly, it improved the environmental awareness among the students in an indirect, albeit very effective manner. Secondly, it had developed their self-esteem within their community who now perceive them as responsible citizens in contributing to solving local problems. Thirdly, the project had helped in ameliorating one of the serious problems of the area, reducing its negative economic, social, environmental and health impacts. Fourthly, the project had generated an income for the school at the rate of L.E. 3,000 per months according to the following calculation:

The cost of producing 20 Hyacinth drawn papers is broken as follows:

Item	**Cost (L.E)**
Transportation of 1 bag of Hyacinth	05
Italian gold color (1/8 of a kilo)	35
Watercolors	20
Oil-based colors	15
Total Cost per un it	75
Cost of 20 Hyacinth papers 75X 20	300

Cost of one painted Hyacinth paper is approximately L.E 5
Projected Profit: (According to the bazaar owner): .
Papyrus-like sheets can be sold at L.E 15 a piece
Gift bags and pyramids miniature at L.E 5 a piece
Projected Profit:
Assuming 1 hour a day of labor producing 15 Hyacinth papers:
Monthly prdouction:15 papers X 20 days of labor = 300 papers a month
Expected Revenue: 300 X 15= L.E 4500
Expenses: 300 X 5= L.E 1500
Cost of one painted Hyacinth paper is approximately L.E 5

Expected Monthly Net Profit:
4500 - 1500= L.E 3000

It is to be noted that the school girls have actually gone beyond what they had been taught in the training, improvising new designs and products. It was their idea to produce papyrus-like sheets, drawing “Pharoanic” depictions on them for sale as Egyptian souvenirs to tourists, with an indicatively high demand for the products.

The Process:
Hyacinth is brought for recycling by fishermen in two different forms; 1) green; stem still filled with water or 2)sun-dried; containing no water
*The green hyacinth is dehydrated and all air ridden and then only the stem is used for the recycling process.
*The sun dried Hyacinth is first put in a pot of boiling water and then Soda Ash is added to soften the tissues.
*Both forms of Hyacinth are bluntly cut using a cutter or by hand.
*A tube containing old/used paper is fully-filled with water to allow the paper to be malleable. The Isna High School for Girls uses old books and notebooks mostly provided by the students.
*The already wet Hyacinth together with paper are put in a mixer with a percentage of 60% and 40%, respectively and water is added to fully cover the mixture.

The mixer:
The mixer used by the school is a modified washing machine where sharp blades are usually added to turn paper into paste and a pipe is attached to allow the mixture to come out. The mixture is then put into a large sack made of breathable material and pressed well to separate paste from water.
The mixture inside the sack is then rinsed with running water to wash the paste of any unwanted residue. The sack is pressed again to get rid of excess water and the mixture is then put in another tube and covered with water twice the amount of the mixture. To add color, a natural fiber is used where it is added to the wet paper. Other colorants can be added. Sometimes to give the paper texture tiny parts of the fiber are left to adhere to the paper Soaves made of a wooden frame and tiny meshed wire is then dipped in the tube to be covered with the paste and raised to filter out the water.
The molds are then held against a wall and pressed by sponges to absorb the water and leave the paper paste hanging on the wall to dry. It can be removed and ready for use in one day time.

9.5.1 Sustainability:

The evident benefits of the project can easily ensure its sustainability. The Positive impact on the students' morale and the income generated from the project will maintain their enthusiasm in production. Furthermore, the revenue generated will maintain the motivation of the school teachers and administration in the project and ensure that they pass it on to the new students who join the school in future years. Not only that, but the art can also be extended to other schools and the community at large.

9.5.2 Replicability:

The project is highly replicable in Egypt as well as in the other Nile Basin countries due to several reasons namely, hyacinth is a problem in all countries of the Basin, the recycling process is of simple technology and products of the recycled hyacinth generate good profit, making the project a good investment. In fact, it was reported that an NGO in Aswan had actually replicated the project in its own premises.

9.5.3Limitations and Challenges:

Potential limitations of the project can be the exhaustion of water hyacinths in the area on the long run. However, to overcome this limitation, the students were taught of different alternate materials that can be included in the production process to substitute hyacinths with agricultural waste. In this respect, waste paper can also be used.

9.6 Conclusion:

The hyacinth recycling project is one of the NTEAP school projects that aim at introducing project-based learning whereby schools are given the opportunity to practice environmental auditing, participate in solving the identified problems and collaborate with their communities through planning and managing activities to induce environmental improvements. The project is highly replicable in Egypt as well as in the other Nile Basin countries while the evident benefits of the project can easily ensure its sustainability. The positive impact on the students' morale and the income generated from the project will maintain their enthusiasm in production. Furthermore, the revenue generated will maintain the motivation of the school teachers and administration in the project and ensure that they teach it to the new students who join in the school in future years. To overcome the problem of potential stopping after the depletion of water hyacinths in the area on the long run, the students were informed of adaptations that can be made to use agriculture wastes instead of hyacinths.

10. Best Practice (8): Environmental Canal Covering in Al-Mahrousa Village:

10.1 Problem Statement:

The pre-project setting could be described as an environmental hotspot, with an uncovered water course, used as a dumpsite across the residential area.

Being a habitat for a number of nuisance disease vectors such as flies, mosquitoes and rodents, this site was classified as a serious health hazard habitat. It was also a good emitter of offensive odorous and a role model of unsightliness that disgraced the whole area. In order to ameliorate these problems, a fully participatory approach in project planning, design, implementation, management and evaluation has been followed.

10.2.Justification for Selection (innovativeness):

The selection of this project is justified by the benefits that it managed to achieve both on the environment and the community members. It had solved the problems associated with the pre-project situation and had introduced new services to the community while generating income for the NGO. This innovative blend of value-adding attributes of the project rendered it worthy of documentation as a best practice.

10.3 Technical Approach: Design and Methodology:

The project main strategy is three-fold: firstly, amelioration of the environmental, social and health problems associated with the pre-project setting; secondly, provision of new service and recreational facilities within the village; and thirdly, the generation of income for the NGO to sustain the operation of the project. The project implementation was undertaken by El Mahrousa CDA.

Plate (16):Public Garden in EL Mahrousa

Under the project, a garden over a sewage canal that was previously covered by the Ministry of Irrigation, was established. The garden covers an area of 1,300 square meters and contains a wedding hall, a children's library corner and a woman's club besides the cafeteria. The total b budget of the project was 123,351 L.E.

10.4 Partnership:

The main partners to the project include the Mahrousa CDA, the Ministry of Irrigation, the local unit, community members and NTEAP.

10.5 Essence of the Best Practices: Benefits and lessons learnt:

The essence of a best practice porject takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability. Before the garden, the neighborhood suffered from several problems namely, garbage thrown in waterways, human and animal wastes spread in the Nile water and on land and insects and rodents were in abundance. The benefits of the project include: (a) an observed eradication of insects and rodents; (b) better quality of air because of the increased green space and creation of a microenvironment; (c) cessation of pollution of the Nile; and (d) increased prices of real estate surrounding the garden. According to the residents rent prices for flats went up from L.E 75 to L.E 100. In addition, the project created a noticeable cultural advancement in the village through constructing a vital recreational window and service facility. For the first time, villagers found a venue to spend their evenings, children acquired an outlet for book borrowing and cultural intermixing and women found a social meeting point. In addition, the wedding hall solved the rooted problems the villagers faced in weddings which they had to organize in the nearest village, 10 km away together with undertaking the necessary arrangements for commuting their invitees. This project had engaged also several people in its implementation and latter on its operation, creating 30 temporary jobs during the construction works and 10 permanent jobs in the operation of the cafeteria, library, wedding hall and women's club thereafter.

10.5.1 Sustainability:

To ensure the sustainability of the services provided by the garden, El-Mahrousa CDA intends on ensuring revenue through entrance tickets, wedding hall rental, cafeteria income and others. It is to be noted that the community contribution in the project amounted to 80,000 L.E. This is a good indication of their appreciation of the project and consequently, their keenness in sustaining it.

10.5.2 Replicability:

This project is a good showcase of how environmental problems can be solved in an innovative manner that also generates cultural and economic benefits within a village. It is thus attractive for replication in villages with a similar setting and problems.

10.5.3 Limitations and Challenges:

The investment cost of the project was relatively high, which might impede its replication in other villages if no external funding is accessible. However, the benefits gained from the project might be a triggering factor to facilitate mobilization of local resources in villages where poverty is relatively less severe which would allow members to donate considerable amounts to finance such a project.

10.6. Conclusion:

This project is a good example of how environmental problems can be solved in an innovative manner that also generates cultural and economic benefits within a village. It had a profound positive impact on the environment, created job opportunities, offered a good meeting place for women, children, and men and solved the financial and logistical problems traditionally associated with weddings. It is a self-sustained project whereby the revenue generated along with the community's interest will ensure its maintenance. As far as replication is concerned, the generated benefits render it attractive for replication in villages with a similar setting. However, replication in other villages might be constrained by lack of resources and hence, external funding could be a pre-requisite.

11. Best Practice 9: Recycling Banana Waste – Shiek Eisa Project

11.1 Problem Statement:

One of the major problems of banana plantations is that the trees have to be fully removed from the land after harvesting the fruits. To get rid of the waste, farmers used to burn it causing air pollution and respiratory maladies to the residents. The other disposal method is throwing the trees in river ways blocking the flow of the Nile water and hence, deteriorating the water quality, depleting fish and providing rats and insects a niche to breed. The aim of the project is to introduce an environmentally sustainable and profitable means of disposal of banana waste through recycling it into an organic fertilizer.

11.2 Justification for Selection (innovativeness):

The selection of this project is justified by the innovative, yet simple process in which agricultural waste is transformed from an environmental nuisance substance into a profitable commodity that increases farmers' incomes and simultaneously protects the environment.

11.3 Technical Approach: Design and Methodology:

The project main strategy is to introduce an innovative technique to recycle banana waste in a manner that: firstly, solves the environmental problems associated with the improper disposal of these wastes; and secondly, transforms the waste into a useful commodity that benefits the farmers and the environment. A TOT approach has been adopted, where 100 farmers have been trained as trainers. Upon the success and dissemination of the process among farmers within the village, the NGO currently generates revenue through renting out the shredder at a rate of 10 L.E. per hour at an average of 25-30 hours weekly. The project was implemented by El Shiek Eisa CDA and involved the procurement of a waste shredder and training on compost making.

Plate (17): Shredder in Operation

The composting process involves the following steps:

First Stage:

Banana tree waste is collected and put into a pile to prepare it for the shredder; other vegetation can also be used.

Second Stage:

The pile is then put into the shredder to get it fine chopped.

Third Stage:

A chemical Formula involving 100 Kg of agricultural soil, 15 Kg Nitrate fertilizer, 5 Kg Phosphate and 5 Kg Calcium Carbonate is prepared and mixed well.

Fourth Stage:

A land of about 6 square meters that accommodates almost a ton of soil is flattened and covered with plastic to avoid seepage of material into the ground.

Fifth Stage:

A pile is built as follows: A layer of banana waste of 20cm height is placed first; a layer of the chemical mixture is then added; the layering process is repeated 4 times so a pile of 6m length X 1m width X 1m height is formed; the pile is then pressed and flattened. water is added once a week in the winter and twice to three times in the summer, ensuring that the pile should not be overly dry; the pile is then pressed and flattened; and water is added once a week in the winter and twice to three times in the summer.

Sixth Stage:

The pile should be turned over to help the disintegration of the chemical formula after a month in the summer and a month and a half in the winter. After 3 months, the pile is then ready to be used as a fertilizer, which for best results should be applied to the land after plowing. Normally fertilization should be done using 50% chemical fertilizer + 50% of compost. It is worth noting that the total budget of the project was 101,238 L.E.

11.4 Partnership:

The main partners to the project include the Shiek Eissa CDA, the training experts, the beneficiary farmers and NTEAP.

11.5 Essence of the Best Practices: Benefits and lessons learnt:

The essence of a best practice project takes into consideration three key issues namely, accrues benifits and lessons learnt, sustainability and replicability. Recycling banana proved to have several advantages. On the environment front, comes the introduction of safe disposal of agriculture waste and the resulting preservation of clear waterways thus saving the Nile water. This also resulted in a reduction of respiratory infections among the village inhabitants as waste is no longer burnt. Eradication of rodents and insects was also noticeable while a reduction of 50% in the use of chemical fertilizers and the associated land and water quality problems were recordable.

On the economic front, composting of banana waste is rewarding as demonstrated by the below listed calculation:

Cost of production of one matrix (6 m3) of compost:

L.E 30 for 15 Kg of Nitrate
L.E 15 for 10 Kg of super phosphate
L.E 5 for Calcium Carbonate powder

L.E 15 for truck transfer of waste
L.E 28 for labour man-days fees
L.E 9 for Rental/depreciation of shredder & maintenance
L.E 4 for water for compost and electricity of shredder

Total cost = L.E 106

Revenue:

Each matrix of 6 m3 waste produces 4.5 m3 of compost
Each m3 is sold for a minimum of L.E 30
Total revenue of one matrix= L.E 135
Net profit from each matrix= L.E 29

Net profit = L.E 5.8/ m3 of waste

Annual Rate of Return = (5.8*4.5 m3)/106 LE/matrix) X 4 matrices/year) = 98% per annum. If farmer is using compost himself, he saves 50% on chemical fertilizer.

"Recycling the waste has become very popular among the farmers," said Haj Saied of Sheik Eissa Civil Association "it saves money, time and most of all preserves the Nile water."

11.5.1 Sustainability:

This project is very sustainable as seen from the revenue the NGO is generating by renting out the shredders.

11.5.2 Replicability:

The benefits gained by the farmers attract an increasing number of farmers everyday, as indicated by the increasing demand for the shredder rented by the NGO. In fact it is reported that this project has been visited by several groups of farmers from other governorates to learn from this model and replicate it in their villages. It is to be mentioned that this technique can be used for any type of waste and not only banana waste.

11.5.3 Limitations and Challenges:

In changing the waste that is to be used, it is to be noted that the chemical composition of the composting mixture, and thus the needed additives, will also vary. Thus it might be necessary to consult a specialist for technical assistance or advice.

11.6. Conclusion:

This project very well demonstrates how environmental problems can be solved in a simple manner that generates substantial income for the beneficiaries. The TOT approach which was adopted rapidly disseminated the technique among the farmers and has allowed the NGO to ensure its sustainability through renting out the shredder. It is a self-sustaining project whereby the revenue generated along with the community's interest will ensure its maintenance.

As far as replication is concerned, the generated benefits of this project render it very attractive for replication in villages elsewhere in Egypt and other Nile Basin countries. In this respect, it is to be noted that this technique is applicable to all sorts of agricultural wastes. However, the change in composting material, and thus needed additives, might necessitate seeking advice from specialists.