



# **The Regional Best Practices Thematic Report**

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## Acronyms and Abbreviations:

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## Executive Summary:

The Regional Best Practice Report is an aggregation of a number of countries' specific best practice reports from the participating member states namely, Brundi, Democratic Republic of Congo, Egypt, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. The regional "Best Practices" can be defined as: "The aggregation of a number of nationally-documented best practice initiatives into their respective thematic areas of focus which could further be replicated on sustained basis at the country, transboundary and cross-border levels". As conduit for knowledge management, the aggregated regional best practices can be disseminated through a regional networking system that usually concatenates a number of nationally established and managed hubs; sometimes known as knowledge house (s).

Though difficult to put together various best practice projects into their respective themes, because of the segregated nature of such projects, this report is an endeavor to give a consistent blend of regionally tradable thematic packages. However, based on the Nile environmental threats, the main thematic best practice projects include those that fit into the below listed areas of focus:

- Environmental Awareness and Capacity building
- Wet Land and Biodiversity Conservation
- Environmental Protection, Improved Sustainable livelihoods and Income Generation
- Soil Erosion and Land Degradation
- Sustainable Water Resource Management and Conservation

The above broad thematic areas of focus generally encompass projects that were originally tailored to achieve the core objectives of the NBI. It is worth noting that while soil erosion and water quality cannot be considered as separate themes, the *raison d'être* for being put as areas of aggregation is because of the total resources being earmarked for each of them.

## 1. Introduction:

The Nile Basin Initiative (NBI) is a transitional mechanism that includes the Nile riparian countries as equal members in a regional partnership to promote economic development and enhance poverty reduction throughout the basin. The NBI leads the process of building confidence among the riparian countries to realize mutual benefits through shared projects. The vision of the NBI is: *"to achieve sustainable socio-economic development through the equitable utilization of, and benefit from, the common Nile Basin water resources"*. In the above context, the NBI has launched a Strategic Action Programme (SAP) to help translate this shared vision into action. The SAP includes two complementary components: firstly, a basin-wide Shared Vision Programme (SVP) consisting mainly of grant-based activities to foster trust and cooperation while building an enabling environment for investment; and secondly, Subsidiary Action Programmes (SAPs) consisting of investment activities aiming to secure sustainable development, economic growth and regional integration. The Nile Transboundary Environmental Action Project (NTEAP) is one of eight SVP projects.

The NTEAP is supporting the development of a basin-wide framework for actions to address high-priority transboundary environmental issues. The key challenges were identified and prioritized through a Transboundary Environmental Analysis (TEA) conducted jointly by the Nile Basin States in preparation for the NTEAP. A prioritized *"Agenda for Environmental Action in the Nile Basin"* emerged from the TEA process and was incorporated in the TEA report. The NTEAP is encouraging more effective basin-wide stakeholder cooperation on transboundary environmental issues by supporting the implementation of priority actions identified in the TEA in five main areas: (a) institutional strengthening; (b) community-level land, forest and water conservation; (c) environmental education and awareness; (d) wetlands and biodiversity conservation (only in Phase 2); and (e) water quality monitoring. The NTEAP supports the Nile Basin countries in developing sound approaches to dealing with transboundary environmental threats at the regional and national level. Focusing on transboundary issues provides the riparian countries with a major opportunity to make significant progress towards their economic and environmental goals in ways that have proven difficult to achieve independently.

More effective cooperation and coordination between the riparian countries is needed if the Nile Basin's environment is to be conserved in ways that help



improve the quality of life of the inhabitants. The Project will strengthen riparian cooperation and coordination through transboundary activities including capacity building, training, education, and awareness raising, knowledge and information sharing, communications, environmental monitoring and activities at selected pilot sites. Consistent emphasis will be given to encouraging diverse stakeholder groups to work together, not only within their own countries, but especially with counterparts in other riparian countries, as an essential contribution to building the mutual understanding, relationships and trust that will be essential to collaborative problem-solving for the Basin as a whole.

One of the prime means to achieve the above is to instate a regional networking system that enhances the exchange of knowledge, experience and practices through nationally based information hubs to be established in each of the respective member countries. The main tool to enhance such cooperation is the effective trading among the member states of the best practices that have been widely documented by the Nile Basin Initiative (NBI). Pursuant to the above, individual countries have documented more than seventy best practice projects, under Microgrant, National Eligible Projects and the School Projects, which addressed various environment threats pertaining to the basin. To facilitate effective trading of those best practices and widely adopt integrated planning intended for resource management, sustainable livelihoods and income generation, all the documented projects were aggregated into their respective thematic areas of focus (**see Annex 1**). These themes, as also mentioned earlier, include Environmental Awareness and Capacity Building; Wetland and Biodiversity Conservation; Environmental Protection, Improved Sustainable Livelihoods and Income Generation; Soil Erosion; and Sustainable Water Resource Management, Improved Quality, better utilization Efficiency and Conservation.

Lastly, the technical contents of the Regional Thematic Report were thoroughly discussed in the regional workshop, convened in Cairo during the period 22 through 25 July 2009, with the objective to better guide various processes, including the establishment of the national information hubs, the enactment of the regional networking system, the articulation of the national advocacy strategy for each member country and further exploration of avenues for replication and expansion of best practices through SAPs.

## 2. Situation Analysis:

As indicated in Table (1) below, the member countries of the Nile basin, at a glance, have been inflicted with a large number of environmental threats that were identified in the Transboundary Environmental Action (TEA) Report, a joint product of the riparian countries. These environmental threats if left unattended to would eventually leave behind a number of implications, both on the humans and the environment. In that context, NTEAP endeavored to implement a number of programmes with the intention to address those challenges and further ameliorate their consequences.

### Basic Environmental Threats in the members countries of the Nile Basin

Table: (1)

No	Country	Potential Environmental Threats
1	Burundi	Biodiversity Depletion, Climate change, Deforestation, Flood/Drought, Degradation, Mining, Siltation, Soil erosion, Wetland Degradation
2	Congo (RDC)	Climate Change, Deforestation, Eutrophication, Flood/Drought, Mining, Loss of Biodiversity, Refugees, Sanitation, Soil Erosion, Wetland Degradation
3	Egypt	Climate change, Eutrophication, Flood/drought, Loss of biodiversity, Navigation risk, Pollution, River bank erosion, Sanitation, Wetland Degradation
4	Ethiopia	Biodiversity Depletion, Climate Change, Deforestation, Eutrophication, Flood/Drought, Loss of Land Cover, Refugees, River Bank and lake Shore, Degradation, Sanitation, Siltation, Erosion and land Degradation, Wetland Degradation
5	Kenya	Loss of Biodiversity, Deforestation, Erosion, Eutrophication, Flood/Drought, Navigation Risk, Pollution, Refugee, Sanitation, Siltation, Waste Management, Water Pollution, Water Weeds, Wetland Degradation
6	Rwanda	Biodiversity, Climate Change, Deforestation, Soil Erosion, Flood/Drought, Lake Shore/River Bank, Degradation, Mining, Pollution, Refugees, Sanitation, Water Weeds, Wetland Degradation
7	Sudan	Loss of Biodiversity, Deforestation, Eutrophication, Flood/Drought, Pollution, Refugees, Sanitation, Siltation, Soil Erosion, Water Weeds
8	Tanzania	Loss of Biodiversity, Deforestation, Soil Erosion, Eutrophication, Flood/Drought, Lake Shore/River Bank, Degradation, Mining, Navigation Risk, Pollution, Refugees, Sanitation, Siltation, Water Weeds, Wetland Degradation
9	Uganda	Deforestation, Land Degradation, Soil Erosion, Eutrophication, Industrial Water Pollution, Lake Shore/River Bank, Loss of Biodiversity, Pollution, Refugees, Sanitation, Siltation, Water Weeds, Wetland Degradation

Source: Nile Basin Countries at a Glance, NBI (December 2005)



More specifically, the key environmental challenges that face the Nile Basin include land degradation, declining water quality, aquatic weeds infestation, deterioration of the environment, pollution, loss of biodiversity, flood/drought, soil erosion, deforestation, sanitation, siltation, wetland degradation, climate change and refugees.



**Plate (1): Water Hyacinth**

Land degradation due to deforestation and cultivation on steep slopes has led to losses of ecologically important habitats, high rates of soil erosion and the sedimentation of rivers, lakes, and reservoirs. Localized pollution from agriculture, industry, mining, and household activities is contributing to the deterioration of the quality of water in the basin. Parts of the basin also suffer from large-scale flooding and periodic droughts.



**Plate (2): Soil Erosion Hazards**

Poverty and population growth impose added pressures on the natural resources of the basin, exacerbated by unsafe and destructive practices in order to meet basic household needs. This phenomenon has led to massive deforestation which culminated into serious land degradation, loss of diversity, strong run-off associated with increased erosion and loss of fertility. Furthermore, these symptoms are associated with non-existence of firewood alternatives, insufficient awareness or knowledge on sustainable resource use and practice and lack of reseeded of deteriorated areas.



**Plate (3): Massive Deforestation**

Exposed soils of degraded lands remain apt to active sheet erosion, particularly in hilly areas and slopes. In the domain of water resources a lot of problems pertaining to its scarcity, quality, utilization efficiency, contamination, rational management and conservation have been registered. To construe, lack of solid



waste management in the urban centers and open defecation in the rural areas have resulted into poor water quality and consequently the prevalence of water borne diseases. Not only that, but also the final dumping of solid waste into the Nile water through feeding tributaries, ditches and irrigation canals have resulted into serious incidents of water pollution.

**Plate (4): Siltation on the Nile Bed**

The massive soil and sheet erosion emanating from degraded lands and steep slopes usually result into the siltation of the Nile bed. This phenomena coupled with the limited irrigation infrastructure has culminated into inefficient irrigation system needed to meet the rising demands for agricultural products and consequently improved water supply at the farm level. It has been observed in certain urban areas that open water canals leave behind a number of in situ environmental hazards, which potentially implicate many people. Dwellers on the watershed around many catchment areas have overexploited the natural resources to the extent that the balance between the ecological footprint and the biological capacity has been seriously disrupted. In this regard, the environmental coherence needed to ensure sustainable livelihoods and food security is potentially jeopardized and that immediate restoration is top on the agenda for natural resource management and conservation. Not only that, but also under the circumstances of water scarcity the competition between the farmers and the herdsmen in the use of the resource usually results into frequent conflicts, which break the peace and tranquility that has been known to exist among the two groups for many years. In this context, the case of the Dinder habitat is a good example to cite. Finally, lack of awareness, appreciation, and understanding of land-water interactions and the importance of conserving critical ecosystems are distinct constraints to the introduction of sustainable development. Rampant poverty coupled with the need to conserve and efficiently utilize the natural resources of the basin have highlighted the vital need to engage with local communities in order to help these communities sustain their environment while securing their own livelihoods. According to the UNDP Human Development Report some of the target communities around the basin are the poorest in the world; an index which is exacerbated by perpetual conflicts, resource degradation and low national capacities to address the major development challenges.

The member countries of the Nile Basin enjoy a rich diversity of ecosystems, habitats, animal and plant species and potential genetic resources. However, due to irrational use of the resources there is now a serious declining trends and loss of many diversity components. In retrospect, many plant species primarily use to meet the food, shelter, clothing, medicine and animal feed either have loss production potential or otherwise offer only little output.



**Plate (5): Domestic Animals**

In addition, wildlife habitats and domestic and wild animals are subject to deterioration due to expansion of agriculture, the case of Sudan, overgrazing, drought, wars, tree cutting, poaching and over fishing. As such, many mammals, birds and fisheries have been continuously threatened.

### **3. Basic Intervention Programmes:**

In support of the five priority actions identified in the TEA, a set of programmes were put into effect namely, the Microgrant supported projects, the National Eligibility Projects, (NEPs) and the School Projects. These could be further elaborated as follows:

#### **3.1 The Microgrant Programme:**

##### **3.1.1 Objectives and Focus:**

A national Nile Transboundary Microgrant Programme was established in each participating country. The activities funded by the Microgrant Programme are flexible in terms of their thematic focus, although all must address transboundary environmental threats in the Nile Basin. Priority will be given to funding local-level projects that: (a) focus on transboundary environmental problems and sites; (b) provide for community participation in their design, implementation and evaluation; (c) pay attention to the needs of women and/or indigenous peoples and practices; (d) draw on local or Nile Basin scientific and technical resources; (e) support capacity development; and (f) communicate best practices to wider audiences. The Microgrant Programme supported community-driven interventions addressing transboundary environmental threats on a local scale and also provided alternative sustainable livelihood opportunities to communities who may otherwise be obliged to overexploit their natural resources.



Microgrant piloted new and promising transboundary initiatives, developed and on the way to disseminate best practices and exchange lessons learned. Particular attention was given to community-based approaches with the potential to: (a) be scaled up or replicated through the NBI Subsidiary Action Programmes; (b) generate regional awareness; and (c) secure additional funding for longer-term Microgrant programmes beyond the life of the NTEAP.

Microgrant projects addressed environmental concerns as well as community needs and interests. Reaching marginal populations and isolated communities was a priority, where promoting sustainable livelihoods was a critically-important entry point. Reconciling environmental goals with poverty reduction was a priority for all of the Nile countries. Establishing environmentally sustainable livelihood opportunities at local levels was a precondition for generating long-term basin-wide environmental benefits, as well as one of the most important ways of generating these benefits. Certain areas within the Nile Basin are not only impoverished, but have been excluded potential development efforts through prolonged years of conflict. Projects in such areas focused mostly on income-generating activities in isolated, poor communities that have had little or no access to technical, financial, or even humanitarian support. Such activities in ecologically-significant areas under enormous exploitation pressure managed to enhance food security while conserving traditional knowledge and protecting threatened ecosystems.

Microgrant Programme provided up to \$25,000 to support NGO, CBO, CSO and community efforts at a local in order to: (a) address threats to the ecosystem of the Nile Basin resulting through the overexploitation of natural resources; (b) provide alternative sustainable livelihood support programmes for communities that are forced to misuse and/or damage the vast natural resources of the Nile Basin; (c) articulate gender-sensitive interventions; (d) restore basic household food security for poor, marginalized communities; (e) raise awareness of the importance of environmental conservation and sound management of natural resources; (f) enhance the capacities in project planning, design, management and monitoring; (g) carry out transboundary activities with partners from other Nile countries; and (h) develop and disseminate best practices. Since the resources available for Microgrant through the NTEAP were basically small relative to the scale of the problems faced by local communities in the basin, candidate projects were carefully selected. Such projects were principally have a strategic value for replication, scaling up, deriving and adopting best practices in land and water management, building awareness and understanding, fostering innovation and enhancing transboundary cooperation, all while responding to the immediate needs and priorities of the participating communities.



### **3.1.2 Operating Principles:**

The Microgrant Programme operated in a participatory, transparent, accountable, decentralized, flexible, responsive, and impartial manner to support community needs and priorities while addressing transboundary environmental issues in the Nile Basin.

### **3.1.3 Applicable Lessons and Best Practices:**

Some of the most important lessons that emerged from small grants experience and their application to Nile Microgrant included the following:

- genuine community participation in project design, implementation, monitoring and evaluation which helped to foster project ownership and significantly increased the prospects for sustaining project benefits;
- impoverished communities were found most interested in activities that addressed their immediate needs and priorities, since communities were given viable alternatives to previous economic and cultural practices that threatened environmental conservation or sustainable development;
- community contributions to projects in cash or kind were important indicator of project ownership, with experience showing that such contributions were often linked to more successful and sustainable project outcomes;
- communities, CBOs, small CSOs and smaller NGOs were lacking the capacity to develop and document projects and proposals, and would require substantial hands-on support and encouragement from the national Microgrant teams;
- the effectiveness of projects was often enhanced by engaging a wide range of partners, including government agencies, research institutions, private sector firms and schools;
- the scale and impact of Microgrant at both programme and project levels could be increased by leveraging co-financing or parallel financing from other donors;
- the voluntary engagement and inputs of National Steering Committee members were critical contributors to programme and project effectiveness; and
- empowering communities and enhancing their capacities in areas such as marketing, quality control and business management helped to ensure the sustainability of projects and encourage replication on a wider scale; simple measures such as training artisans in how to maintain and repair new technologies (e.g. biogas, micro-hydro or fuel-efficient stoves) simply led to new viable businesses that also enhanced project sustainability.



### **3.1.4 Institutional Arrangements:**

The institutional arrangements for the Nile Microgrant drew on the best practice model of the SGP, although the specific arrangements vary by country. Implementation of the SGP was decentralized and country driven, providing a window for NGOs, CSOs, local communities and other grassroots organizations to participate directly in the development process.

The SGP was premised on the principle that environmental problems can only be addressed adequately if local people are involved, and that with small amounts of funding local communities can undertake activities, which will make a significant difference in their lives and their environment. The NTEAP Microgrant programme had adopted this principle.

The SGP is managed in each country by a National Steering Committee and a National Coordinator (NC), with support from the UNDP Country Office. The National Steering Committees are composed of voluntary members from NGOs, academic and scientific institutions, other civil society organizations, key government agencies, and UNDP, with the majority of members coming from the non-governmental sector. The NC and National Steering Committee are responsible for ensuring that participatory, impartial, flexible, rapid, and transparent procedures for project review and approval as well as all other aspects of program implementation are established and practiced at the country level.

## **3.2 National Eligible Projects (NEPs):**

### **3.2.1 Objectives and Focus**

Recognizing the importance of the piloting and demonstration approaches to test different environmental management techniques, the Steering Committee of NTEAP in its Second Meeting in 2005 decided to allocate additional resources for government agencies to identify suitable techniques to address some pressing environmental issues. Twenty percent of the annual project budget was approved by the PSC for Government's agencies/departments to identify and implement pilot projects that addresses government priority environmental problems and on this basis these pilots were named as National Eligible Projects (NEPs). The main objectives of the NEPs were to: firstly, implement tangible environment protection projects in the basin that generates long-term basin-wide environmental benefits, directly or indirectly; secondly, involve communities, NGOs, that may not participate in the microgrant program for various reasons; thirdly, respond to country level needs; fourthly, demonstrate that NTEAP is moving from planning to action; and fifthly, support enhanced project activities and budget implementation.

Eligible grantees for the NEPs included women's associations, youth organizations, universities, professional associations, government agencies, and community based organizations. The funding ceiling per pilot was up to US\$ 55,000 and the thematic focus of the pilots followed the main components of the project which included the following:

- Institutional strengthening;
- Community land, forest and soil conservation;
- Environment Education and Awareness;
- Water quality Monitoring; and
- Wetlands and Biodiversity Conservation.

### **3.2.2 Operating principles:**

Unlike the Microgrant, which is managed and implemented by NGOs, NEPs are identified, managed and implemented under the direct supervision of the Government represented by the environment agency in each riparian country. These pilots are implemented in a participatory and transparent fashion and has enjoyed the full support of the government agencies. This implementation arrangement although it has posed some complexity due to multi stakeholders, has created stronger ownership and paved the way for replication and up scaling of successful pilots by the riparian governments themselves.

## **3.3 The School Projects:**

### **3.3.1 Objectives and focus:**

Taking into consideration the importance of piloting and demonstrating approaches to test different environmental management techniques, a number of School Projects had implemented in the member countries of various strengths and objectives, albeit with remarkable successes. The rationale behind these projects is three-fold: firstly, to address lack of awareness on environmental conservations that exists among many resource users in the rural areas; secondly, to enhanced the capacity of the main resource users in environmental conservation and sustainable rural development through method demonstration programmes; and thirdly, develop low cost simple technologies that can be transferred to the rural areas.

The focus of the School Projects include the following:

- environmental awareness and capacity building;
- environmental conservation;



- sustainable livelihoods and income generation;
- wetland and biodiversity conservation;
- skills development and productive capacity building; and
- development and transfer of simple environmental conservation technologies.

### **3.3.2 Operating Principles:**

In all cases the School Projects are closely managed and implemented by the school based Environmental Clubs and supported by the school management. Such arrangement is meant to involve the young generation in environmental issues and let them establish the direct link between the schools and the surrounding communities so that the school remains as an important center of excellence on environment. The modus operandi is that the school turns to be a center for practical classes, method demonstration, farmers' organized days and capacity building for the community members. These projects created stronger ownership between the school and the community which vital for massive involvement of local people in environmental protection programmes.

## **4. Thematic Areas of Focus: Regional Best Practices:**

### **4.1 Basic Definition:**

The regional "Best Practices" can be defined as an aggregation of a number of nationally-based best practice initiatives into their respective thematic areas of focus and can further be replicated on sustained basis at the country, transboundary and cross-border levels. As conduit for knowledge management, regional best practices can be disseminated through the creation of a regional networking system that is usually run by a centrally managed hub, sometimes known as knowledge house.

### **4.2 Thematic Best Practice Aggregates:**

The regional profile of best practices includes those national, cross-border or transboundary initiatives that have been aggregated into thematic areas of focus.

Though difficult to put together into respective themes, because of the segregated nature of some national project, this report is an endeavor to give a consistent blend of regionally tradable projects. However, based on the Nile environmental threats, the main thematic best practice projects include those that fit into the below listed areas of focus:

- Environmental Awareness and Capacity building;
- Wet Land and Biodiversity Conservation;





- Environmental Protection, Improved Sustainable livelihoods and Income Generation;
- Soil Erosion Control and Land Degradation; and
- Sustainable Water Resource Management, Improved Quality, Better Utilization Efficiency and Conservation.

The above broad thematic areas of focus generally encompass projects that were originally tailored to achieve the core objectives of the NBI. It is worth noting that while soil erosion and water quality cannot be considered as separate themes, the *raison d'être* for being put as areas of aggregation is because of the total resources earmarked for each of these areas.

### **4.3 Technical Analysis (Overview):**

In piloting a number of microgrant initiatives an integrated approach of environmental conservation, sustainable livelihoods and income generation has been followed. In so doing, this approach was found to be feasible, since all pilots proved to be cost effective in calling for proper utilization of financial, human, natural and material resources. At the national level, land degradation, severe deforestation and soil erosion stand as key environmental problems. The massive over cutting of forest resources resulted in a remarkable deterioration of the basin's catchment area as well as loss of farming lands. The immediate impact of these environmental problems is a strong run-off associated with increased gully erosion, loss of cultivable land, reduced soil fertility, decreased agricultural production and hence increased food insecurity.

#### **4.3.1 Environmental Awareness and Capacity Building:**

A number of challenges that affect negatively both natural resources and human welfare, have been identified during the best practice exercise conducted by NTEAP within the nine riparian countries of the Nile Basin. Obviously, the key environmental misuses are: traditional farming practices, over grazing, over cutting of trees, water pollution, population growth and related pressures on the resource base. But, all of these problems are linked to negligence on the part of the population regarding the rational resource use and lack of basic information on environment assets and sustained value.

With regard to Environmental Awareness and Capacity building, more than twelve Projects have been documented, which were meant to better serve the NTEAP vision in promoting environmental education and awareness.

The rationale behind most of these integrated projects is to use the school, in addition to its mandated role for education, as a center of excellence in order to promote environmental management through the establishment of school based Environmental Clubs. The schools were also used as a demonstration fields in



order to allow both the students and the various communities to learn more about the various ecological conditions of the respective countries, further understand the role of trees in carbon sequestration and acquire the capacity to replicate the positive results of the school based projects. In addition to that religious institutions have also been used to promote environmental conservation within the context of a preserved environment.

**Plate (5): A Sign for School Project**

Having most of the projects being implemented in chronic food insecure areas, they systematically followed innovative means to ameliorate a number of environmental, social, physical and economic problems, whereby the club members get the opportunity of applying the concept of project-based learning in helping their own communities.



**Plate (6): An Environmental Club**

The strategic approach for environmental awareness raising and capacity building is to integrate environmental education into the school curriculum and subsequently diffuse the knowledge to the local communities through open outreach days and further promote the dissemination of improved farming techniques and environmental conservation among farmers through sensitization, training and practices.



Analogous to the above is raising the capacities of the Community Development Associations (CDAs), like the unique case of Egypt, in order to protect the environment where a number of income generation activities were simultaneously integrated as direct incentives for the beneficiaries. The ground implementation of some of these projects calls for a number of approaches to link resource users to their environment: Firstly, adoption of environmental friendly local technologies instead of the non-biodegradable imported materials. Secondly, an important area of environmental awareness and capacity building is the use of alternate energy with the objective to conserve the environment. Associated with this is the introduction of the small-scale biogas infrastructures, constructed in order to sensitize and train the communities on environment conservation issues namely efficient use of the biogas energy source and pollution control. Thirdly, an important area of knowledge is waste recycling and the need to convert it to useful products while simultaneously improve the environment. Fourthly, through capacity building programmes, a lot of efforts had been made to promote indigenous knowledge and practices that proved effective in maintaining the environment and enhancing sustainable livelihoods. Fifthly, due to poor agricultural production as a consequence of deteriorating environment a number of capacity support programmes were implemented in improved farming techniques, use of organic manure and coming up with alternative livelihoods to augment loss in farm productivity. Though a number of beneficiaries were trained in many areas related to environmental conservation in order to promote sustainable livelihoods, some key hindrances which tend to affect wide scale replication of innovative programmes have been recorded:

- land limitation;
- conflict of interest between herders and farmers; and
- drought.

Most of the selected projects under this theme, implemented either by the clubs or the communities focused on: (a) deforestation and land degradation; (b) soil and water pollution pertinent to chemicals pesticides, fertilizers, industrials waste, solid waste, organic and plastic waste; (c) water hyacinth and weeds infestation; and (d) food insecurity. These projects are usually pivoted on five sets of interlinked activities, namely: (a) school connectivity to enhance exchange of knowledge and skills between the students and their communities; (b) adopt an award approach to promote competition among the students and resource users; (c) practical demonstration days for sensitization within and outside the schools; (d) seminars; and (e) adoption of the innovation by the respective communities. Positive impact on the environmental, level of awareness created among students and resource users and income generation as basic incentive remain to be the key indicators for the success of the school-based projects, their future sustainability and their further dissemination.

The best practices identified and documented during the exercise in support of capacity building include the following:

(a) Project for Capacity Building for NGOs and Farmers in Developing Organic Production and the Reduction of Persistent Organic Pollutants. The project is implemented in Eastern Province of Rwanda and is disseminating organic farming techniques among farmers through sensitization, training and practices. (See details and photo of each in the National report).

(b) Environment Awareness and Capacity building (School project). The project is implemented in West Province of Rwanda, It helped to build the capacity of pupils, teachers and local communities in integrated environment conservation issues, especially soil conservation by sensitization, training and implantation of demonstrative activities at school and in villages.



Plate (7): Rainwater Harvesting Infrastructure at School Plate (8): Alinus Associated with Climb beans

(c) Agro-farming and Biogas Installation Project (School project). The project is located in Kayanza province of Burundi. It is a small scale pigsty associated to biogas infrastructures, contributing efficiently to sensitize and train pupils and teachers on environment conservation issues, especially alternative sources of energy, zero grazing and pollution control.



Plate (9): Pigs Breeding by Cooked Food Remains Plate (10): Biogas Infrastructures using Manure from Pigsty

(d) Project of Radical Terraces Arrangement for Integrated Sustainable Agriculture and Livestock.

The project arranged and disseminated pilot and demonstrative radical terraces integrated to sustainable agriculture and livestock and showed to other people of the region how a high slope hill can be managed and valorized in a region with high population density.



Plate (11): ICA, the Integrated Terraces Project



Plate (12): Radial Terraces within ICA Compound

(e) Promotion of indigenous knowledge in the management of Tree Seedlings in Nurseries. The project located in Tanzania calls for the establishment of nurseries using environmentally friendly local materials such as banana tree/biomass tubes and manure instead of the polythene tubes which are non biodegradable in nature.

(f) Raising the Productive and Institutional Capacity of four community Development associations (CDAs) to protect the environment. The project implemented in Egypt, contributed to raise the capacity of the Community Development Associations to protect the environment.



Plate (13): An Evacuation Tractor, EL Zawida Village.



Plate (14): Public Garden for Children, EL Makhadma

(g) Recycling Hyacinth in Isna High School for Girl, Qena Governorate, Egypt. The Hyacinths project introduced innovative means to ameliorate a number of environmental, social, physical and economic problems, whereby students get the opportunity of applying the concept of project-based learning in helping their own community.



Plate (15): Hyacinth Final Products In Egypt

(h) Out of Class Rooms Environmental Education: the Case of Wad Medani Girls Secondary School, in Sudan. The mini-project was primarily designed and implemented through mobilizing female students to establish a mini-forest in the school to be used as a demonstration field.



Plate (16): A Visible Sign on Carbon Sequestration

(i) Gohatsion Secondary and Preparatory School Project, in Ethiopia. The project served as a practical demonstration area for deforestation, land degradation and soil erosion.



Plate (17): The Club Office



Plate (18): Members of the Club

(j) Kassim Primary School. The National Eligible (NEP) project supported a number of schools which are located in chronic food insecure areas of Tigraye, Amhara and Oromia regions.



Plate (19): School Vegetable Gardening



Plate (20): Kassim Primary School

(k) Addis Zeman Preparatory School Environment Education Club, in Ethiopia. The integrated project used the school, in addition to its mandated role for education, as a center of excellence in order to promote environmental management through environmental club.



Plate (21): The School Surroundings Turned into a Thick Forest



Plate (22): Shelter Belt Protecting Zeman School



(l) Project Based Learning: Waste Recycling, in Kenya. The practice contributed to the integration of Environmental Education into the school curriculum and subsequently diffuse the knowledge to local communities.

For each of the above best practice projects there are many documented benefits and good lessons learnt which can be up-scaled, disseminated and further replicated in member countries of the basin, which were detailed in the respective National Reports.

#### **4.3.2 Wet Land and Biodiversity Conservation:**

The main objective of the Wet Land and Biodiversity Conservation initiatives is to address three environmental threats namely, deforestation, wetland degradation and loss of biodiversity, while contributing to poverty alleviation, which is the root cause of environmental degradation. Related projects were able to explore avenues for alternate source of livelihoods following the failure of the traditional systems to sustain the increasingly growing rural population under a syndrome of declining productivity as a consequence of unfavorable environmental conditions pertaining to the wetlands.

On the part of the fauna documented projects were intended to reduce the pressure on the natural resources and to provide a better refuge habitat for a large number of endemic species. In connection to this, the case of the Monarchy project in Ethiopia (Bahr Dar) is a good example to quote. Projects under this theme touched on a variety of areas: Firstly, there was a focus on providing alternate livelihoods following the failure of the traditional systems to sustain the living of the continuously growing population utilizing the wetland ecosystems. Secondly, some of the projects built on previous GEF projects with the objective to reduce the pressure on the natural resources and provide a refuge to a large number of endemic species. Thirdly, some of the projects focused on deforestation and wetland degradation, while contributing to poverty reduction, which is the root cause of resource deterioration. These projects include:

(a) Artificial Mass Production of Catch Fish: The pilot is meant to explore avenues for alternate source of livelihoods following the failure of the traditional livelihoods to sustain the increasingly growing rural population in Ekerewe Island of Tanzania.





**Plate (23): Active Fish Pond**

(b) Promotion of Up-land Rice in Kagera Region of Tanzania: The project calls for a shift to grow upland rice instead of farming along the wetland areas (low land rice), hence reducing pressure on the latter.



**Plate (24): Field of Upland Rice**

(c) Agro-Summer Farm Employment Creation and Poverty Reduction in Rahad Villages, Gedaref State, Sudan: This project was a follow up to the previous GEF project "Conservation and Management of Habitat and Species of Biodiversity in the Dinder National Park" with the intention to reduce the pressure on the natural resources and provide a refuge for a large number of endemic species.



**Plate (25): Irrigation in Support of Summer Farming**

(d) Joseph Boys High School: Apiculture for Forest Conservation and poverty Alleviation aims at addressing two environmental threats namely, deforestation and wetland degradation, while contributing to poverty alleviation regarded as the root cause of environmental degradation in Kena.

(e) Restoration of lake Cohoha Biodiversity: The project calls sustainable use of wetlands resources and restoration of lost biodiversity for the benefits of the riparian population of Burundi.

(r) Project of delimitation of Ruvubu National Park, Brundi: The project is to ensure community participatory protection of the National Park.



**Plate (25): Lake Banks Eroded by Human Activities**

At the thematic level the key limitations include:

- wetland resources put under tremendous pressure;
- limited land resources provided a competitive environment for resource users;
- loss of wildlife habitats; and
- lack of resources to adopt alternate solutions.

#### **4.3.3 Environmental Protection, Improved Sustainable Livelihoods and Income Generation:**

In the thematic area of Environmental Protection, Improved Sustainable livelihoods and Income Generation, more than 26 projects, addressing diverse problems, had been documented. The strategy is to implement a number of projects with the objective to conserve the environment while injecting improvement of sustainable livelihoods and income generation as community incentives. It follows that a wider space has been given to poverty reduction and food security, while simultaneously pushing the agenda of environmental protection.

In the above context, a group of projects had been implemented to address various environmental threats. One of the successful initiatives, in this regard, is the Goat Restocking Programme under zero grazing which was intended to enhance effective environmental conservation, perpetuate poverty reduction and improve the health status of children and people infected with HIV/AIDS



**Plate (26): Goat Restocking**

One of the successful initiatives, in this regard, is the Goat Restocking Programme under zero grazing which was intended to enhance effective environmental conservation, perpetuate poverty reduction and improve the health status of children and people infected with HIV/AIDS. Goats under the zero grazing regime pose no implications on the environment since fodder production was integrated into the farming system. Another interesting example



is the Recycling of Banana Waste project which advocated for an 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.

**Plate (27): The House Before and After the Initiative**

In the domain of poverty reduction a local community-based organization (CBO) known as Support for Enterprises and Economic Development (SEED) in Kenya involved a church group to eliminate some cultural barriers that ensnare poor and vulnerable widows where a woman is inherited by one of the in-laws as soon the husband dies. The innovation found to break independency of women by building their capacity to manage environmental friendly technologies for housing, thus reducing reliance on deforestation for building purposes. Moreover, this innovative approach was found to reduce the incidents of HIV/AIDS by eliminating the traditional system of inheritance. In the above thematic area of focus of the key environmental concerns is the reported massive loss of the valuable medicinal plants in Ethiopia.

In order to address this issue the project: “Itsecomol Medicinal and Indigenous Plant Conservation” project adopted the motto “Saving Lives by Saving Medicinal Plants” which remained to be a prime evidence to promoting conservation and sustainable use of the medicinal plants in primary health care through community based approaches.



Plate (28): Medicinal Plants Center Plate (29): List of Medicinal Plants Plate (30):Some Medicinal Plants

One of the key hindrances of environmental protection through massive reforestation programmes, is the unavailability of seedlings during the rainy season due to lack of water to support the primary nurseries in the drier parts of Ethiopia. In this regard, the Ambo School project calls for income generation, enhancement of sustainable livelihoods and environmental conservation through generation of low cost technology of rainwater harvesting to provide supplementary irrigation of tree seedlings and vegetables. This simple technology had supported many areas to raise trees and shelterbelts to protect houses as well as the crop fields.



Plate (31): Tree Nursery Plate (32): Vegetable Gardening Plate (33): Rainwater Harvesting

An important concern in environmental management in Ethiopia is the protection of the highlands from further degradation while providing a source of livelihoods. A good example here was the Highland Fruit and Natural Resource Conservation Initiative which was intended to engage many young farmers and women headed households in fruit production and environmental conservation activities through massive sensitization programmes. Raising of fruit trees in highlands together with the accumulation of mulch provided a good stand in reducing soil and sheet erosion and hence arresting remarkable environmental degradation.



Plate (34): Apple Tree Seedlings



Plate (35): Fruit Trees to generate income

A Good approach that proved to be effective in reducing massive tree cutting is the introduction of alternate energy sources namely the biogas, into many target areas where a massive number of old trees had been eliminated to provide energy for the rural communities. In this context, the Integrated Biogas System in Mumias Sugar Cane Zone of Kenya and in Bunda District of Tanzania are successful examples in promoting such alternate technology and reducing pressure on the forest resources. Not only that, but also the further use of the by-products (sludge) of the energy system for the effective retention of soil fertility and hence improved agricultural production. Concurrent with this, some nurseries had been established to assist in rural afforestation programmes.



Plate (36): Biogas Unit



Plate (37): Tree Nurseries at Bunda

For most of the countries of the basin, another environmental hazard is the accumulation of waste in the towns and the major urban centers and the dire need for its elimination. A successful endeavor in this regard is the "Solid Waste Management in Busia Town of Uganda". Firstly, the pilot project had well demonstrated solid waste management in further reducing a reported health hazard and pollution of Lake Victoria; and secondly, contributing to increased household incomes through waste recycling mostly, compost for organic farming (fruits and vegetables), poultry raising and selling fuel briquettes.

In the above context the below listed projects were implemented by all the member states:



- (a) Goat Restocking Programme: The Goat Restocking Programme in Buhemba area, Tanzania, was intended to enhance effective environmental conservation, perpetuate poverty reduction and improve the health status of children and people infected with HIV/AIDS.
- (b) Poverty Reduction and Environmental Protection in Sabnas Island (Nile State), Sudan. The NGO, Eastern Sabnas Development Society, in association with the Ministry of Agriculture, worked together with the objective to mobilize community members in order to generate cash and in kind resources to address the problems that constrain agricultural production.
- (c) Itsecamol Medicinal and Indigenous Plants Conservation Project: The motto adopted by the project: "Saving Lives by Saving Medicinal Plants" in itself is a prime evidence that this project is promoting conservation and sustainable use of the medicinal plants in primary health care through community based approaches in Ethiopia.
- (d) Monarch Environmental Support Programme (Baha Dar, Ethiopia): The objective of the project is to strengthen the role of the Church in advocating for and promoting environmental protection/conservation and natural resource development through directly involving potential resource users.
- (e) Ambo Secondary and Preparatory School Project , Ethiopia: The project calls for income generation, enhancement of sustainable livelihoods, environmental conservation and generation of low cost technology for rainwater harvesting in order to provide supplementary irrigation for tree seedlings and vegetables.
- (f) Sadini Biyyo Primary School, Ethiopia: The project is meant to create an enabling environment within the present state of the prevailing abject poverty where parents could not afford to send their children to school and that the students' enrolment is totally dependent on school feeding.
- (G) Highland Fruit Production and Natural Resources Conservation, Ethiopia: This initiatives was intended to engage a number of young farmers and women headed households in fruit production and environmental conservation activities through firstly, sensitization programmes; and secondly, practical approach conducted in three target Kebeles.
- (h) SEED Sheltering the Widows, Kenya: A local community-based organization (CBO) known as Support for Enterprises and Economic Development (SEED) decided with a church group to eliminate some cultural obstacles that ensnare poor and vulnerable widows and break in dependency of women by building their capacity to manage environmental friendly technologies for housing.
- (i) Integrated Biogas System in Mumias Sugar Zone for Poverty Alleviation and Environmental Conservation, Kenya: The main objective of the project is to introduce alternate energy source to alleviate pressure on the forest resources and further use the by-products (sludge) of the energy system for the effective retention of soil fertility and hence improved agricultural production.



(j) Solid Waste Recycling in Kyotera Town Council, Uganda: The project is to enhance solid waste management in Kyotera Town, hence firstly, contributing to reduced health hazards and pollution of Lake Victoria; and secondly, enhancing increased household income through waste recycling mostly, compost for organic farming (fruits and vegetables), poultry, selling fuel briquettes and bee-keeping

(k) Kukuuma Environmental Support Project, Uganda: The aim of the project is to boost income generation, improve health conditions, enhance environmental protection and promote alternative renewable energy use.

(l) Animal Traction to Reduce Soil Erosion around River Muvumba, Rwanda: The main objective of the project is to reduce land degradation due to extensive cattle tracks and contribute to poverty reduction.

(m) Environmental Conservation through use of Alternate Energy, Rwanda: The project is meant to reduced the intensity of deforestation by promoting alternative sources of energy for cooking.

(n) Promoting Environmental Friendly Farming Practices in the Kagitumba, Rwanda: The project is intended to protect the transboundary Muvumba watershed and induce positive nutritional behavior within the community.

(o) Improved Stoves/Bee keeping, Brundi: The project is to reduce tree cutting and improve quality of life for households.

(p) Avocado Tree Grafting: The project is to reduce both land degradation and food insecurity in Brundi.

(q) Women Mainstreaming in Participatory Forest Conservation and Reforestation, Brundi: The project is intended to contribute to the socio-economic development and improve protection of catchments

(r) Improvement of Environmental Conditions for Irregular Workers in Nage El Awary Village- Qena, Egypt: This project was intended to support the poorest households through construction of low- cost sanitation units in order to ameliorate some health, social and environmental problems.

(s) Support and Development of Traditional Handicrafts, Egypt: The project, Support and Development of Traditional Handicrafts, is to revive sustained rural self employment for improved household income.

For this thematic area of focus, the main limitations include:

- implications of the climate change;
- land limitation;
- lack of appropriate and low cost technologies;

- Prevalence of pests and diseases;
- inadequate extension services; and
- lack of resources.

#### 4.3.4 Soil Erosion Control and Land Degradation:

The Analysis of the environmental threats to the Nile Basin revealed that, almost all the countries, are suffering from the problems pertaining to soil erosion. These problems are usually manifested in loss of top soil, sheet and gully erosion, deterioration of the watershed areas, loss of fertility and siltation of the Nile. A unique case is that of Uganda where the high pressure on the natural resources led to severe land degradation leading to gully erosion, loss of soil fertility and water recharge from Rubana River into Lake Victoria had gone down. To address this issue a number of projects had been implemented through the Microgrant programme and the Schools and National Eligible Projects.

In the above context, the Jejeba Watershed Project in Ethiopia had managed, through integrated environmental conservation pilot intervention, to halt down severe soil erosion, recess deforestation and enhance proper watershed management.



Plate (38): View of the Slope



Plate (39): plantation of steep slopes

With respect to the above, another good example is NYADEC- Gully Rehabilitation project which is a demand-driven community-based self-help initiative in Nyando District of Kenya, where erosion had turned previously fertile land into rugged and deep gullies directly affecting as many as 500-600 households. In addressing the gully erosion a remarkable success had been made in practical healing and if the trend continues, many gully affected areas will be completely resorted.





Plate (40): Gully Formation



Plate (41): Gully Erosion Control

Another outstanding phenomenon is the deterioration of the catchment areas as well as along river banks which both constitute an important source of siltation of the river bed. To ameliorate this problem, some countries of the basin have succeeded to introduce on-farm forestry and agro-pastoral systems as key measures along the river catchments and river bank in order to conserve river source, reduce soil erosion and recess river siltation. For the same problem in Rwanda soil erosion control practices were successful using local technologies such as integrated radical and progressive terraces and retention ditches, all the way along the slope.

In some cases genuine efforts were made to address the serious phenomenon of river bank erosion and sand deposition into rivers, which remain to be a potential sources of siltation and hence river bedding. In this regard, for example, Uganda



has come up with a package of techniques that proved to be so useful in curbing the above tow environmental hazards. These include massive afforestation porgrammes around the rivers' banks; halting encroachment of agriculture close to the rivers; and leaving a no activity zone of 10 meters away from the rivers' courses each side.

Plate (42): Riverbank Erosion and Sand Deposition

In Tanzania the high pressure on the natural resources had been addressed through the promotion of biogas technology in order to provide a space for the regeneration of the natural resources. Under the above theme a number of projects had been implemented which include:

(a) Promotion of Biogas in Bunda District, Tanzania: Due to the high pressure on the natural resources there was severe land degradation, loss of soil fertility and water recharge from Rubana River into Lake Victoria had gone down. The project is intended to reverse this phenomenon.



(b) Household Based Forest Development in the Upper Jejeba Watershed , Ethiopia: The Jejeba Watershed Project objectives call for an integrated environmental conservation in order to halt down severe soil erosion, recesses deforestation, enhances proper watershed management.

(c) NYADEC Gully Rehabilitation, Kenya: NYADEC- Gully Rehabilitation project is a demand-driven community-based self-help initiative in Nyando District of Kenya, where erosion had turned previously fertile land into rugged and deep gullies directly affecting as many as 500-600 households.

(d) Conservation of Nyandera Stream Catchment for Sustainable Water Supply, Food Security and Income Generation, Kenya: The main objective of the project is to introduce on-farm forestry as a measure along the river catchments and river bank to conserve river source, reduce soil erosion and recess river siltation.

(e) Integrated Soil Erosion Control in Murambi and Gakoma Sectors, Rwanda: Prevents soil erosion using integrated radical and progressive terraces and retention ditches.

(f) Integrated Soil Erosion Control in Muko and Rwaza Sectors, Rwanda: Prevents soil erosion through integrated terraces.

(g) Erosion control Project and integrated agriculture to livestock, Rwanda: Protects crop fields against erosion and intensify of agro-pastoral activities.

(h) Erosion control and Improved soil fertility, Brundi: Reduces soil degradation and enhances food security.

(i) Tree Planting and Soil Conservation Practices Around Mount Tshiaberimu, DRC: Tree planting and soil conservation practices around Mount Tshiaberimu to prevent further soil erosion.

The key limitations under this theme include:

- pressure on the soil and the path of land degradation do not tally with the coverage of the conservation measures;
- more local technologies intended to reduce soil erosion need to be developed
- legislative measures need to be enacted; and
- more resources are needed to up-scale soil conservation measures.

#### 4.3.5 Sustainable Water Resource Management, Improved Quality, Utilization Efficiency and Conservation

The main problems pertaining to the thematic area of Sustainable Water Resource Management, Improved Quality, Utilization Efficiency and Conservation in Egypt, Sudan, Ethiopia, Uganda and Brundi include loss of irrigation water, hazards imposed by open canals, inadequate provision of water for nomads, water quality, deteriorating watersheds, poor solid waste management and impeded fishing and navigation.

A number of waste management initiatives, mostly Microgrant and school projects, had been piloted to deal with solid waste disposal. An innovative approach in this context is to make use of the solid waste as a raw material for conversion into useful products as an incentive to encourage many people to get engaged in removal of solid waste which usually litters many urban and rural centers. For example, conversion of some solid waste into fuel briquette is not only an income generation activity, albeit it is an alternate source of energy that discourages dependency on wood as a primary source of energy. Moreover, another serious threat relating to inadequate solid waste management is the resultant Nile water pollution, in almost, all the Basin countries.

This had been resolved by putting efficient waste management systems in many Nile water sources, particularly those villages close to the Nile and Major irrigation canals.

In Egypt, a part from protecting the Nile from pollution by solid waste wastewater is usually collected and further used to generate income through the sales of timber from extensive agroforestry programmes under an extremely arid ecosystem. Though benefits can only be accrued in the long term, yet farmers were so enthusiastic to get indulged into this initiative.



Plate (43): Evacuation Tractor for Waste Water

In countries where there is a high demand for irrigation water, genuine efforts should be made to enhance water management at the conveyance system in order to reduce seepage losses, reduce weeds infestation and better control some disease vectors. Not only that, but also poor conveyance usually results into delivery of less water for the crops, hence reduced yields of various crops.



**Plate (44): Canal Lining**

In Egypt, through the canal lining approach, had adequately addressed the problem of high seepage losses of irrigation water, increased utilization efficiency by 100%, reduced weeds infestation, eliminated the high incidents of worms and retarded the reported heavy breeding of mosquitoes. This approach had resulted into enhanced irrigation efficiency to meet the rising demands for agricultural products and consequently improved water efficiency at the farm level. As a consequence of that seepage losses were reduced by 100% and that crop fields were increased by more than 40%. Most importantly that the Canal Lining project has significantly reduced gas emissions (GHG) from the diesel pumps which were used during the pre-project situation to provide supplementary irrigation as a result of the inefficient water conveyance system.

In Sudan there are always potential conflicts between the authorities of the Dinder National Park and the nomads regarding the latter encroaching into the Park searching for water. As a consequence of that a serious damage is caused to the Park. A good arrangement to defer the nomads away from the Park is to enhance water development outside the Park – the Mayaa Development system, both out and inside the Park.



**Plate (45): Mayaa Development**

Accrued benefits from the Mayaa development approach is two-fold: firstly, water development endeavors outside the Park significantly halted down encroachment of the nomads into it and further reduced competition on the water resources between wild and domestic animals; and secondly, water development within the Park provided sustained drinking water for the wildlife.

Following the full implementation of this programme, water was made available for the nomads, the Park was conserved and conflicts were avoided in most of the time. In Ethiopia the basic problem pertaining to water resource management is the deterioration of the watershed due to irrational use of the resources in the surrounding areas. In this regard, a Community Watershed



Plate (46): Nursery for Massive Afforestation

Management pilot project was implemented to assist the communities, dwelling around the watershed, to restore the environmental coherence of the area through integrated watershed management within the context of a preserved environment, sustainable development and household food security. To that effect, remarkable achievements had been made.

Not only that, but also the project further enhanced the capacity of the dwellers on biological and physical soil and water conservation measures on farmlands.



Plate (47): Carrots within Trees



Plate (48): Beans within Trees

This is mostly done by a number of agroforestry packages in areas around the watershed which usually receive high pressure from the resource users. In addition to that, a number of successful zero grazing piloting was done to encourage farmers to reduce overgrazing and hence land degradation. In Sudan, Egypt, Rwanda and Brundi the noxious water Hyacinth poses serious implications on navigation, fishing and a harbor for many water borne disease vectors. Respective projects in those member countries removed the water hyacinth through cycling it into useful products that generated a good income especially for women.

A number of projects proved to be successful in addressing water resource management using various cost effective technologies which can also be easily managed by the target beneficiaries. These include:

(a) Irrigation Water Canal Lining in Egypt: The Irrigation water canal lining is meant to enhance water use efficiency in order to boost domestic agricultural production.



(b) Nile River Protection from Pollution by Solid Waste and Wastewater in Wadi Abadi Village, Aswan, Egypt: To protect the Nile from pollution by solid waste and use collected wastewater to generate income for the implementing NGO through extensive agroforestry programmes under an arid ecosystem.

(c) Piloting Community Based Water Conservation through Innovative Techniques to Increase Irrigation Water Use Efficiency in Sugar Cane Plantation, Egypt: The project is to enhance the irrigation efficiency to meet the rising demands for agricultural products and consequently improved water supply at the farm level.

(d) .Environmental Canal Covering in Al-Mahrousa Village, Egypt: The Canal Covering project was primarily set as a fully participatory approach in project planning, design, implementation, management and evaluation, which was intended to ameliorate a number of in situ environmental hazards identified during the pre-project planning stage (uncovered water course).

(e) Water Supply and grazing for Nomadic Groups, the caase of Sam Turuk - Gedaref State, Sudan: The project is to ensure continuous supply of water for the nomads in order to avoid destruction of Dinder Habitat.

(f) Establishment of Natural Water Cooling Unit in Dueim High Secondary School for Girls, Sudan: The above project was based on the concept of the Cooling System Unit articulated by the Sudan University of Science and Technology to further promote environmental conservation where electrical appliances are costly.

(g) Shotelemat –Mentara Community Watershed Management, Ethiopia: The Community Watershed Management project was designed to assist the communities, dwelling around the watershed, to restore the environmental coherence of the area through integrated watershed management within the context of preserved environment, sustainable development and household food security.

(h) Lay Michael Integrated Watershed Management Project, Ethiopia: Lay Michael Integrated Watershed Management initiative was meant to protect, conserve and improve natural resources for efficient and sustainable production of the main food crops which in turn improved the household food security; triggered the awareness of villagers on environment and HIV/AIDS; and further strengthen their capacity on biological and physical soil and water conservation measures on farmlands.

(i) Solid Waste Management in Busia Town Council, Uganda: The main objective of the project is to reverse poor solid waste management in Busia Town Council and further improve the quality of water by directly addressing potential pollution of River Sio, then Lake Victoria where the river ends and ultimately the River Nile.

(j) Integrated Control of Water Hyacinth (*Eichhornia crassipes*), Rwanda: Remove the water hyacinth from Akagera river and increase its value by use it as raw material for handcraft making.

(j) Water Hyacinth Control to protect Akagera River Watershed, Brundi: The project is to remove the water hyacinth from Akagera River and associated wetlands and increase its



value by use it as substratum for mushroom cultivation and compost for crop fertilization.

## **5. Climate Change:**

Within the context of documenting the best practices, climate change is taken as a cross cutting theme. The countries of the basin, labeled as LDCs, are active parties to the United Nations Framework Convention on Climate Change. In this respect, the NB member countries have marked avenues of future cooperation with the international community in reducing vulnerability to the aftermaths of Climate Change. Most of the countries of the basin are fully aware of the fact that adaptation to Climate Change has to be fully factored into the respective national development planning processes. Under the present circumstances a number of Climate Change related variables have grossly jeopardized people's own efforts to adapt to the, then, associated risks.

Drought has led to the repetitive crop failures and hence seriously affected household food security to the extent that a number of localities within the countries of the basin were labeled as continuously ramifying on food aid. Not only that, but also this has led to the disintegration and further haphazard dispersion of families within the affected countries. Shifting cultivation, deforestation for energy and housing and overgrazing have all commingled to induce land degradation, soil and gully erosion, reduced soil fertility and hence poor productivity of field crops.

The art of best practice has been adequately used to identify projects that have the potential to enhance adaptation to the risks associated with Climate Change, if they are up-scaled or replicated in wider areas. The criteria used to identify such projects include, among others, the following:

- (a) perpetuate income generation;
- (b) support poverty reduction;
- (c) enhance food security, including alternative livelihoods;
- (d) striking a balance between ecological footprint and biological capacity;
- (e) enhance public awareness;
- (f) build the capacity to effectively use local and/or improved technology;
- (g) accrued benefits cover a large number of resource users; and
- (h) support sustainable water resource development.

## Projects that Have the Potential for Adaptation in the NB Countries:

Table (2)

Key Area of Adaptation	Identified Project	Country
Income Generation	Improved Stoves, Bee Keeping	Brundi
	Avocado Tree Grafting	Brundi
	Rehabilitation of Fish Ponds	DRC
	Goats Breeding	DRC
	Support and Development of Traditional Handicraft	Egypt
	Recycling Banana Waste	Egypt
	Itsecomol Medical Plants Conservation	Ethiopia
	Monarch Environmental Support Programme	Ethiopia
	Highland Fruit Production	Ethiopia
	Integrated Control of Water Hyacinth	Rwanda
	Goat Restocking Programme	Tanzania
Poverty Reduction	Promotion of Mushroom Cultivation	DRC
	Improvement of Environmental Conditions for Irregular Workers	Egypt
	Seed Sheltering the Widows	Kenya
	Agro Summer Farm Employment Creation	Sudan
	Poverty Reduction and Environmental Protection in Sebnas Island	Sudan
Food Security	Radial Terraces Arrangement	Brundi
	Development of Organic Farming	Rwanda
	Promotion of Upland Rice In Kagera Region	Tanzania
Balance Between Ecological Footprint and Biologicak Capacity	Erosion Control and Improved Soil Fertility	Brundi
	Tree Planting and Soil Conservation Practices	DRC
	Shotelemat-Mentara Community Watershed Management	Ethiopia
	Lay Michael Integrated Watershed Management	Ethiopia
	Household Forest Development In the Upper Jejeba Watershed	Ethiopia
	NYADEC Gully Rehabilitation	Kenya
	Animal Traction to Reduce Soil Erosion	Rwanda
	Integrated Soil Erosion Control in Murambi Sector	Rwanda
	Promotion of Biogas in Bunda District	Tanzania
Kukuuma Environmental Support Proejct	Uganda	
Enhance Public Awareness	Gohatsion Secondary and Primary School Project	Ethiopia
	Kassim Primary School	Ethiopia
	Addis Zeman Preparatory School Environmental Education Club	Ethiopia



	Project Based Learning	Kenya
<b>Capacity Building</b>	Raising the Productive and Institutional Capacities of Four CADs to Protect the Environment	Egypt
	Badini Biyyo Primary School	Ethiopia
	Ambo Secondary and Preparatory School Project	Ethiopia
	Joseph Boys High School	Kenya
	Out of class Rooms Environmental Education	Sudan
	Promotion of Indigenous Knowledge in the Management of Tree Seedlings	Tanzania
	Involving School Communities to Conserve Lake Victoria	Tanzania
<b>Accrued Benefits Cover a Large Number of People</b>	Women Mainstreaming in Participatory Forest Conservation and Reforestation	Brundi
	Delimitation of Ruvubu National Park Project	Brundi
	Construction and Rehabilitation of Fish Ponds	DRC
	Environmental Canal Coverage, Al Mahrousa Village	Egypt
	Conservation of Nyandera Stream Catchment	Kenya
	Establishment of Natural Water Cooling Unit	Sudan
<b>Support Sustainable Water Resource Development</b>	Irrigation Water Canal Lining	Egypt
	Nile River Protection from Pollution from Solid Waste and Wastewater	Egypt
	Piloting Community Based Water Conservation	Egypt
	Water Supply for Nomads	Sudan
	Solid Waste Recycling in Kyotera Town	Uganda
	Solid Waste Management in Busia Town	Uganda

## 6. Gender Perspective:

Despite the many efforts being made by the member countries of the basin to mainstream gender in environment and sustainable development, nevertheless some technical, economic, traditional and socio-cultural hindrances are yet to remain as major constraints towards achieving constant, albeit substantive progress, in the state of affairs. These include, but not limited, to the following:

- high incidents of poverty, particularly among widows and the elderly;
- low technical and productive capacities;
- limited access to grant and credit facilities;
- disparities in access, opportunities and control over the resources;
- entrenched traditional and cultural norms; and
- weak institutional setup.

## 7. Sustainability:

Within the context of best practices the notion of Sustainability (core project and implementation components) is defined as: "The constant managing of results, impacts and opportunities in order to achieve ever lasting benefits". In order to indefinitely perpetuate sustainability, there is a need to balance the ecological footprint with the existing biological capacity. In here, potential resource use is constantly below the resource capacity. Core components that enhance sustainability include:

- availability of right technical tools;
- funding;
- capacities;
- local accountability;
- conducive policy environment;
- strong partnership among parties concerned;
- Ownership; and
- strategic monitoring

In most of the projects under all thematic areas of focus the adoption of simple, technically viable and economically feasible local technologies was the norm. In this regard a lot of examples could be cited namely, recycling of water Hyacinth, gully healing, soil erosion control using micro-basin water structures, agroforestry, rainwater harvesting, spring development, slope cultivation, improved sugar cane plantation, zero grazing, solid waste recycling; to name only a few.

Though the initial funding through NTEAP window was not enough, yet either the results attained by many projects were instrumental in attracting cost-sharing funding or communities were encouraged to use their own resources to replicate some of those successful initiatives. In this respect, good examples were reported in Egypt (Gena) and Tanzania (Ekrewa Island).



One of the important captions in Egypt that Ms. *Hoda explained: "That their 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"*.

Following comprehensive review of all the best practices, a number of indicators that showed signs of sustainability had been identified. These include: (a) accrued benefits, be that in cash or in kind; (b) positive changes in the perception and attitudes of the resource users, including commitment and motivation; (c) use of local technologies in addressing various problems such as recycling of waste, water hyacinth, sustainable livelihoods and others; (d) strong indication of longer term benefits subsequent to some preliminary visible impact; (e) acquired skills and capacities; (f) building of a stronger partnership with some cost-sharing funding or replication; (g) clear signs of poverty reduction; (h) documented cases of replication; and (i) integration of essence of some best practice in local development plans and/or policies. In this context, almost all of the documented best practices had shown one or more of these sustainability indicators. However, sustainability could sometimes be constrained by external factors such as climate change and conflict.

## **8. Replicability:**

Replicability under the notion of best practices is defined as: "An existing viable chance to repeat an activity, a programme or a project with demonstrated accrued benefits of a similar problem in a similar ecosystem". In other words, activities – to- results once assessed as being feasible, they will then have the chance to be repeated in a similar ecosystem. A significant challenge in replication of best practices is to initially create a "fit" between the key components of the best practice project that need to be replicated and actual needs of the target communities. Prior to replication, best practice projects require:

- clear orientation of targets
- presence of an institutional framework
- a technical networking
- viable linkages (CBO, NGO, grassroots)
- planned field-based outreach programmes
- commitment for integration into national policies and programmes

While replicability holds the same definition as desegregated best practices, still in the regional context adopters may have the liberty to select the top contributors to the aggregate outcome/impact of the respective theme.



In the regional context and following the above pre-requisites for replication, many best practice projects remain to be tradable within the region and hence have the chance to be replicated. These include gully erosion control, waste management, water hyacinth control, alternate sustainable livelihoods, alternate energy projects (biogas and fuel briquette), soil erosion control, the school projects on environmental protection and sustainable livelihoods, integrated water resource development, irrigation efficiency (the canal lining), management of the slopes, watershed management, gender tailored activities and capacity building.

## **9. Limitations and Challenges:**

Limitations here, in most of the cases, concentrate on those key factors affecting the fulfillment of the established vision, achievement of the regional core objectives or the attainment of the strategic areas to be supported by a particular theme. If at all there are regional variations in the capacity to conceive and/or implement certain projects, these could be stated as limitations likely to occur in some courtiers within the region.

## **10. Conclusion:**

This chapter includes basic remarks at the thematic level which are likely to affect the design of certain projects, tradability, sustainability, replicability or certain limitations associated with the theme itself. Also in this chapter, constraints related to given projects could also be hinted out so that they give adopters pre-selection guidance.

The key lessons learnt include the following:

- (a) An integrated approach has been adequately followed in the design of, almost all the projects, where environmental conservation, sustainable livelihoods and income generation are the main design pillars in the one hand and constitute the right incentives which motivated beneficiaries to actively participate in all the projects (Egypt, Tanzania, Uganda and Ethiopia).
- (b) A strong component of capacity building is envisaged, all through, which includes sensitization of beneficiaries and other stakeholders, technical on-the-job training, practical demonstrations, outreach porgrammes, participatory gatherings and events for competition. Generated skills include, among others, project design (Egypt), implementation, management and monitoring of the projects.



Enhanced capacity of beneficiaries and stakeholders is one of the key factors for the sustainability of the project.

- (c) Despite the limited funding, most of the pilot projects were successful in coming up with tangible and visible outcomes, albeit they will only have a wider effective impact in the basin following replication and up-scaling.
- (d) The perspective of the beneficiaries is inclusive, since vulnerable groups, women and the poorest were targeted by many projects.
- (e) Most of the projects, particularly those intended for soil erosion, gully healing, land degradation, fish farming, solid waste management and others remained captive to local expertise and technologies.
- (f) Most of the projects had managed to build stronger partnership which led to their immediate success, albeit in some cases the absence of some instrumental parties remained at the detriment of effective implementation of such initiatives.
- (g) Though some projects proved to be successful the conflict of interest among parties concerned may tend to restrict their replication and up-scaling.
- (h) Without a strong resource mobilization strategy to be launched by the respective member states, up-scaling of some projects will be jeopardized.
- (i) Success made in attaining a balanced land use system in some places, necessitates that a land suitability classification is needed in areas where the balance between the ecological footprint and the biological capacity is distorted (hillside/slope management projects).
- (j) Though projects on recycling of solid waste proved to be successful both as income generation and environmental conservation initiatives, however, through time, the raw material will be depleted hence early exploration of new avenues for material inputs is a prerequisite (water hyacinth and town litter).
- (k) Though the goats restocking programme is a good strategy towards poverty reduction, yet unless a zero grazing regime is imposed and a higher annual off-take rate is encouraged, expansion of such programme should be carefully weighed against the resource base, otherwise it will lead to more land degradation.



- (l) Introduction of biogas as an alternate technology was so successful in many areas in significantly reducing tree cutting, albeit a more flexible credit system, including group lending, should be explored to cater for the initial high investment capital of the technology.
- (m) Sustainability of environmental conservation and protection projects that are based on in cash contribution of beneficiaries primarily depends on the size of the membership: “success with many, failure with less”.
- (n) A number of projects created an enabling environment to pursue the link between environmental conservation and local policy framework.