LESSONS LEARNT ON CATCHMENT AFFORESTATION COMPONENT OF THE LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROJECT

SUBMITTED TO

LAKE VICTORIA ENVIRONMENTAL MANAGEMENT PROJECT (LVEMP)

By

S.A.O. Chamshama (Consultant)

Sokoine University of Agriculture
Faculty of Forestry & Nature Conservation
P.O. Box 3010
Morogoro, Tanzania

August, 2005

EXECUTIVE SUMMARY

Background

Lake Victoria is a shared water body by the three riparian countries of Kenya, Uganda and Tanzania. The lake covers a surface area of 68 800 km^2 and catchment area of 184 000 km^2 and supports approximately 30 million people. The lake is important for the socio-economic well being of the surrounding communities and the national economies in terms of fish production and water for domestic, industrial and agricultural use. The lake is also of scientific interest as it habours some endemic fish species. The natural forest resources of the catchment area are also important due to a myriad of goods and services. The benefits include non-wood forest products (NWFP), timber, poles, firewood, catchment protection, soil conservation, preservation of biodiversity, carbon sequestration and moderation of climate.

Because of the indicated benefits and developmental potential of the Lake Victoria Basin (LVB), the basin has been experiencing high population growth. This coupled with poverty and weak regulatory mechanisms, has resulted into serious environmental problems with the most obvious ones being: declining of water quality, disappearance of indigenous fish species, frequent fish kills, water hyacinth infestation and algae blooms, deforestation, severe soil erosion and destruction of wetlands.

The Lake Victoria Environmental Management Project (LVEMP) is a regional programme for the three East African countries and was initiated in 1997 to reverse the deterioration of the lake quality and its natural resources. The long-term development objectives of LVEMP are to: (a) Maximize the sustainable benefits to riparian countries from using resources within the basin to generate food, employment and income, safe water supply and sustain a disease free environment (b) Conserve biodiversity and genetic resources for the benefit of riparian communities and the global community (c) Harmonize national management programmes in order to achieve, to the maximum extent possible, the reversal of increasing environmental degradation. The first phase of the project was set to achieve the following: (a) To provide the necessary information, to improve management of the lake ecosystem (b) To establish mechanisms for cooperative management by the three countries and (c) To identify and demonstrate practical, self-sustaining remedies, while simultaneously build capacity for ecosystem management.

To achieve the project objectives, LVEMP is implemented in ten components. One of these components is catchment afforestation. The component was conceived to reverse land degradation in a participatory manner. The main objective of the component is to increase forest cover and arrest soil erosion through conservation.

Project activities have been going on for seven years. The three East African countries are now preparing a proposal for phase two of the project and requested the services of consultants to provide analysis of components activities, interventions and approaches with a view to draw lessons learnt during the last seven years of project implementation. This report presents an analysis of the catchment afforestation component of LVEMP.

Methodology

Due to time limitations, the fieldwork was done in selected project sites. Information/data was collected using the following approaches: a) review of various documents (background documents, research reports, progress reports and other supporting documents) b) discussions with staff (project, partners, other related projects) c) interviews with farmers and farmer-groups and d) visits to see field activities.

Major Findings

Achievements Compared to Planned Targets: The component initiated its activities during the year 1997/98. The areas of concentration being Mwanza region (Sengerema, Mwanza and Misungwi districts) and Mara region (Bunda, Musoma Rural and Tarime districts).

A mid-term review of LVEMP was conducted in February 1999. Among the decisions of the review mission with regard to catchment afforestation component were: moving the component office from Mwanza to Musoma to concentrate activities in Mara region due to limited resources and shelving the improved stove activity.

The main component activities have been: production of tree seedlings and field planting, natural forest conservation, natural forest reservation, forest rehabilitation monitoring, awareness raising and dissemination and capacity building. The component achievements as compared to planned targets shows that overall, the catchment afforestation component either achieved or exceeded the planned targets. However some weaknesses in techniques and strategies for the various activities were noted.

***Production of Tree Seedlings*:** Production of seedlings for planting as woodlots or on farm is done in central, commercial and individual nurseries. In the group commercial nurseries, in the first season, the project supports the groups with seeds, nursery materials, equipment and transport while the group members provide labour. The project also trains groups on nursery establishment and management before the nursery work commences. The project buys seedlings from the groups for distribution to communities at a cost of Tshs 100.00. During the following season, the groups are supposed to plough back part of the income in raising seedlings, and the project reduces support. Individual farmers also produce seedlings but these are not purchased by the project.

The project has carried out a production cost analysis of the three types of nurseries. The study showed that individual nurseries cost Tshs 8.60 per seedling, central nurseries Tshs 89.90 and commercial nurseries Tshs 118.75. While central nurseries look cheaper compared to commercial group nurseries, often there are logistical problems associated with seedlings transfer to villages.

***Tree Planting and Management*:** Field planting of seedlings is done in individual or group woodlots and in individual farms. The main species planted include: *Grevillea robusta, Eucalyptus saligna, Acacia nilotica, Senna siamea, Mellea azaderach, Casuarina equisetifolia* and *Azadirachta indica*, while the following species have been planted to a limited extent: *Acrocarpus flaxinifolius, Khaya anthotheca, Cedrella ordorata,Terminalia ivorensis, Terminalia manthaly, Dovyaris caffra, Pithecelobium dulce, Markhamia lutea, Moringa oleifera* and *Albizia lebbeck.* Fruit trees include: *Psidium guayava, Mangifera indica* and *Persea Americana.* All the species except *Acacia nilotica*, *Khaya anthotheca, Markamia lutea* and *Albizia lebbeck* are exotic. There is a need in future to emphasize more planting of indigenous species in the LVB as well as nitrogen fixing tree species; the later will also improve soil fertility when planted in farms. Great care is needed in the selection of exotics as some of these are considered

in other countries to have negative hydrological effects or have become invasive. Spacing, site preparation and weeding varied, and in most cases the intensity of site preparation and weeding was reflected in tree performance. Trees in intercropped plots were also found to have good performance.

Management of Natural Forests: The catchment afforestation component has assisted the survey, boundary demarcation and mapping of six potential village forests reserves. The communities surrounding these forests have also with the assistance of the component staff prepared by-laws and simple management plans for managing the forests. One of these forests was visited (Kigambabitare), and the forest show clear signs of recovery, and communities now complain of wildlife damage. The forest after recovery now harbours various types of wildlife.

Reconnaissance survey was carried out in all existing 36 forest reserves in Mwanza and Mara and their status established. Two of these namely Kyarano and Kyanyari have been put under Joint Forest Management (JFM) where four surrounding villages of Butiama, Rwamkoma, Nyamikoma and Mwibagi have prepared management plans and bylaws for managing the forests.

Forest Rehabilitation Monitoring: The catchment afforestation component has established permanent sample plots in a well-conserved forest (Kigambabitare) and in an unreserved forest (Mwitore) to compare forest improvement due to reservation. Also three run-off plots each for the reserved and un-reserved forest have been established for assessing run-off and soil erosion. These PSPs and run-off plots will provide quantitative data and save, as a good demonstration of rehabilitation to communities as seeing is believing.

Awareness Raising and Dissemination: Awareness raising workshops were conducted to all district leaders, technicians and politicians of the 15 districts where LVEMP is operating. As a result of this, the component is enjoying political support in the pilot districts. Awareness raising workshops were also held in the pilot villages, and all farmer groups were trained on nursery establishment and management techniques. There is a manual on nursery establishment and management prepared by the project. During field visits, it was clear that communities today consider catchment afforestation beneficial to their livelihoods and environment. They now positively view trees and nearly all communities in the pilot villages have trees in their farms or woodlots. However, It appears awareness raising has not been very effective due to the continuing deforestation for charcoal and firewood noted during field visits. In some villages, neither the communities nor the village leadership seem concerned. Awareness raising should be a continuous process and should involve a variety of methods.

Capacity Building**:** Capacity building for staff involved study tours, graduate training and short courses. Overall the courses have improved the capacity of the staff in various aspects of natural resource management.

Monitoring and Evaluation**:** Monitoring of project activities is currently carried out by regular/irregular visits to the villages by Catchment Afforestation component staff. In August each year, component staff visit a sample of villages and farmers to count plant survival. In other cases attention is mainly directed to the manner things have been done and provide advise on corrective measures. Quantitative records of achievements of various activities in the villages are important for later evaluation. Farmers if given the training and the forms to be filled could collect these records.

Also socio-economic studies to monitor changes that occur over time after the interventions have been introduced so as to assess adoption and impact are important. These act as a follow-up of the baseline survey data if collected.

Infrastructure: The component uses a building it renovated in 1999, owned by the Government. The component has several office and field equipment. A shortfall of the following items was indicated: lorry for seedlings transport and patrols, still camera, video camera and audio-visual aids.

Interventions Tested and Approaches Used: The Catchment Afforestation component has been testing two main interventions namely promotion of tree planting in monoculture or intercropping (agroforestry) and natural forest management. In both of these interventions, the component has been working with communities from planning to implementation. The outcomes of the tested interventions could have been higher if: the Catchment Afforestation and Soil and Water Conservation components were working in the same pilot villages, a catchment approach was used and paraprofessionals were used to assist with follow-up of implementation and monitoring.

***Contribution of Catchment Afforestation to the Community and Environment*:** In all the villages visited, communities acknowledged that the Catchment Afforestation component through awareness raising, support to seedlings production and management of natural forests have all made them consider forest resources much more important to them and the environment. For those in commercial nursery groups, seedlings sales have enabled them to pay for various costs. However, awareness raising has not been very effective due to the continuing deforestation for charcoal and firewood noted even in some pilot villages during field visits. In some villages, neither the communities nor the village leadership seem concerned.

Collaboration: Overall, intra and inter-component collaboration is considered satisfactory. However, as pointed out else where there could have been higher impact if the Catchment Afforestation and Soil and Water Conservation were working in the same pilot villages.

The LVEMP Catchment Afforestation component maintains some informal collaboration with other natural resource management programmes in the LVB. Collaboration has mainly been in form of assisting with seedlings, exchange of publications, participation in meetings and technical advice.

Problems and Constraints: Not withstanding the significant achievements recorded so far, the project faces a number of constraints/impediments. The major constraints/impediments pointed out by stakeholders are: limited financial resources, staff shortage, poor remuneration of government civil servants, termite problems, livestock and fire damage to seedlings, drought, poor species-site matching.

Lessons Learnt

From this review, there are a number of important lessons that provide the basis for recommendations to guide the way forward in Catchment Afforestation of the LVB. The following lessons are noteworthy: (a) Improvement of water quality in the lake depends on successful rehabilitation of the basin to control soil erosion and reduce siltation and eutrophication. However, the component has received inadequate attention in terms of prioritized actions and budget allocations. (b) There could have been higher impact if the Catchment Afforestation and Soil and Water Conservation were working in the same pilot villages using the catchment approach. (c) Production cost of seedlings is much lower in individual nurseries, followed by central nurseries and commercial private

nurseries. (d) Tree survival and growth depended on species-site matching and intensity of cultural techniques. (e) Distribution of benefits and costs under JFM has not yet been resolved. Long-term sustainability of JFM is contingent upon its ability to generate adequate benefits to its members. (f) Monitoring of project activities has in most cases been irregular. Continuous monitoring and evaluation of farmers' activities and provision of feedback is crucial in project activities as it enhances adoption and farmers are motivated to perform. (g) Absence of/inadequate collaboration with other relevant programmes results in lost opportunities in terms of harmonizing strategies/approaches.

Way Forward

The way forward for the component is up scaling of the pilot activities to all the three regions (Kagera, Mara and Mwanza). There are however several challenges/key issues which have to be resolved to make the up scaling a success. The recommendations in the following section arise from the challenges/key issues discussed in this report.

Recommendations for the Future

The following are the main recommendations for consideration during the second phase of the project: (a) The component should be accorded higher priority and budget during LVEMP II. The component should therefore become a core component (b)The Catchment Afforestation (should be renamed Catchment Management) should work together in the same villages with the Soil and Water Conservation and should use the catchment approach (c) In future, private nurseries should be given more priority. Communities should be assisted with improved seeds and polythene pots, and should sell seedlings among themselves instead of the project buying and reselling to other communities without nurseries (d) Species should be matched to site and preference should be given to suitable indigenous species as well as N-fixing species. Intercropping should be encouraged. Indigenous and exotic fruit trees should also be encouraged (e) Relevant LVEMP components should adopt the strategy of training farmers as trainers during scaling up (f) Awareness raising should be a continuous process involving all village members and should use a variety of methods (g) The component should design simple monitoring forms and train selected farmers how to use them (h) Equitable cost-benefit sharing mechanisms under JFM should be developed by the government and relevant stakeholders. (i) Alternative income generating activities like beekeeping should be included (j) Improved firewood/charcoal Stoves: This activity was shelved during LVEMP I. It should be included in the second phase (k) There should be socio-economic studies to monitor changes that occur over time after the interventions have been introduced.

Conclusions

For each output, the catchment afforestation component had set indicators of achievement. Overall the component as per the set targets and indicators has performed extremely well. Within the short period of the component existence, communities and other stakeholders have raised and planted trees, and are protecting their natural forests. The discussions in the villages clearly show that communities are now much more aware of the benefits of forests to the environment and livelihood than before.

However despite these achievements, the LVB is still facing serious deforestation and land degradation. The main challenge of the component is to scale-up and cover all the regions of the basin. This challenge can be easily overcome if the proposed recommendations are effectively implemented.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS AND ACRONYMS

AM	Aide Memoire
BRAC	Buhemba Rural Agricultural Centre
CBO	Community Based Organization
DDP	District Development Programme
FBD	Forestry and Beekeeping Division
HASHI	*Hifadhi Ardhi Shinyanga* (Shinyanga Soil Conservation Project)
JFM	Joint Forest Management
LFA	Logical Framework Analysis
LVB	Lake Victoria Basin
LVEMP	Lake Victoria Environmental Management Project
MNRT	Ministry of Natural Resources and Tourism
NBS	National Bureau of Statistics
NGO	Non Governmental Organization
NWFP	Non Wood Forest Products
PRA	Participatory Rural Appraisal
PSP	Permanent Sample Plot
RAS	Regional Administrative Secretary
SECAP	Soil Erosion Control and Agroforestry Project
Tshs	Tanzania shillings
WWF	World Wildlife Fund
VEW	Voluntary Extension Worker
VIFAFI	Sustainability for Victoria Farming and Fishing Project

LIST OF TABLES

1. INTRODUCTION

1.1 Background

Lake Victoria is a shared water body by the three riparian countries of Kenya, Uganda and Tanzania. The lake covers a surface area of 68 800 km^2 and catchment area of 184 000 km^2 (LVEMP 2001a) and supports approximately 30 million people. On the Tanzania side the catchment area is in three regions namely Kagera, Mwanza and Mara. The lake is important for the socio-economic well being of the surrounding communities and the national economies in terms of fish production and water for domestic, industrial and agricultural use. The lake is also of scientific interest as it habours some endemic fish species. The natural forest resources of the catchment area are also important due to a myriad of goods and services. The benefits include non-wood forest products (NWFP), timber, poles, firewood, catchment protection, soil conservation, preservation of biodiversity, carbon sequestration and moderation of climate.

Because of the indicated benefits and developmental potential of the Lake Victoria Basin (LVB), the basin has been experiencing high population growth. This coupled with poverty and weak regulatory mechanisms, has resulted into serious environmental problems with the most obvious ones being: declining of water quality, disappearance of indigenous fish species, frequent fish kills, water hyacinth infestation and algae blooms, deforestation, severe soil erosion and destruction of wetlands (LVEMP 2001a).

The Lake Victoria Environmental Management Project (LVEMP) is a regional programme for the three East African countries and was initiated in 1997 to reverse the deterioration of the lake quality and its natural resources.

The long-term development objectives of LVEMP are to:

- Maximize the sustainable benefits to riparian countries from using resources within the basin to generate food, employment and income, safe water supply and sustain a disease free environment.
- Conserve biodiversity and genetic resources for the benefit of riparian communities and the global community.
- Harmonize national management programmes in order to achieve, to the maximum extent possible, the reversal of increasing environmental degradation.

The first phase of the project was set to achieve the following:

- To provide the necessary information, to improve management of the lake ecosystem.
- To establish mechanisms for cooperative management by the three countries.
- To identify and demonstrate practical, self-sustaining remedies, while simultaneously build capacity for ecosystem management.

To achieve the project objectives, LVEMP is implemented in ten components. The components are: Fisheries Management, Fisheries Research, Water Quality and Ecosystem Management, Water Hyacinth Control, Wetland Management, Catchment Afforestation, Soil and Water Conservation, Micro-projects, Support to the University of Dar es Salaam (Faculty of Aquatic Sciences and Technology) and the Regional/National Secretariat. The project focuses its efforts on two major sets of activities. While the management components address specific environmental threats at specific pilot sites, the other set of activities aim at improving information on the lake, capacity building and lake wide direct interventions. However, inter-component collaboration is emphasized.

1.2 Purpose of the consultancy

The purpose of the consultancy is to provide an analysis of Catchment Afforestation component activities, interventions and approaches with a view to draw lessons learnt during the last seven years of the component implementation as background information for the preparation of LVEMP II. Detailed Terms of Reference (ToR) are shown in Annex 1.

2. BACKGROUND OF LVEMP CATCHMENT AFFORESTATION COMPONENT

The Catchment Afforestation component is one of the ten components of LVEMP. The Forestry and Beekeeping Division (FBD), Ministry of Natural Resources and Tourism (MNRT) implements the component.

A baseline study conducted when the project started in 1997 showed that the major threat to catchment and other forests surrounding the lake is deforestation and land degradation. The direct causes of deforestation include: agricultural expansion (subsistence or commercial farming), settlement expansion (local inhabitants and refugees), firewood gathering and charcoal production, overgrazing, uncontrolled fires, mining, logging, and infrastructural and industrial developments. The underlying causes of deforestation are rapid (and uncontrolled) population growth, poverty, market failures (pricing and valuation techniques), policy failures (inadequate government financial and managerial capability, poorly defined property rights, low forest rent) as well as structural adjustment programmes (trade liberalisation and reduced Government expenditure) (Kaoneka 2000).

The link between poverty, population growth and environmental degradation is recognized. Population growth in the basin is high (about 6%) while 18%, 30% and 36% of the households in Kagera, Mwanza and Mara regions respectively live below the food poverty line (NBS 2002). Also between 79 and 85% of the households in these regions are dependent on agriculture and because of poverty, farmers cannot afford agricultural inputs and increase in food production is by horizontal expansion of agricultural land with serious consequences on forests. The pressure on forests for firewood and charcoal is also high as 80-92% and 5-18% of the households depend on firewood and charcoal respectively as main energy source for cooking (NBS 2002). Rapid urban expansion also contributes to loss of forest cover. For example a study conducted in 2000, showed that Mwanza

city consumes about 438 102 m^3 with a deforestation rate of about 17 777 ha (MNRT 2001).

The consequences of land degradation are usually deleterious to human populations. The main consequences of such degradation and deforestation include: shortage of firewood, other wood products and NWFP, increased sediment deposits, floods and land slides leading to loss of life, population displacement and reduced food production, sheet and gully erosion making land unproductive, reduced quantity and quality of water from catchments, drying up of springs, siltation of dams, increased incidences of water-borne diseases, loss of biodiversity, climate change and desertification.

The catchment afforestation component was conceived to reverse land degradation in a participatory manner. The main objective of the component is to increase forest cover and arrest soil erosion through conservation of natural forests and tree planting with involvement of communities. Main component activities include: tree seedling production and field planting, development of local seed sources, forest monitoring, management of existing natural forests in general lands and reserves, creation of new forest reserves, awareness raising of communities on catchment protection and tree farming, and strengthening forest extension services. Annex 2 shows the Logical Framework Analysis (LFA) of the component.

3. APPROACH AND METHODOLOGY

3.1 Inception meetings

Prior to commencement of field work, two inception workshops were held.

(a) Introductory meeting at LVEMP offices in Dar es Salaam on 17th June 2005

This meeting was called by the Regional/National Executive Secretary Mr. C. Nyirabu to brief the consultants on the project and the assignment.

(b) Inception workshop held in Mwanza on 18th June 2005

The Lead Consultant Dr. Okeyo-Owuor facilitated the inception workshop. Presentation and discussions were on the regional work plan, roles of all involved in the assignment, reporting format and expected outputs of individual consultants.

3. 2 Study Approach

Field work for the review was done from July 6-13, 2005. Annex 3 presents the itinerary while the list of people contacted and their respective positions is given in Annex 4.

Information for this study was collected through interviews and discussions with various people who play different roles in the LVEMP Catchment Afforestation component's efforts to increase forest cover and arrest soil erosion in the LVB. The review matrix of key issues, their indicators, sources of information and

means of collection (Annex 5) was used while holding discussions with the various stakeholders.

- Individual and group discussion approach was used to share information with Catchment Afforestation component management and technical staff.

- Individual and group discussions were held in 9 villages with communities and community groups and Village Council (VC) members.

- Individual and group discussions were also held with staff of Partner organizations/Other related programmes.

- Discussions were held with teachers of two primary schools and officer in-charge of one prison.

- Visits were made to some sites with project activities, and participant observation was used throughout field visits while travelling and during discussions.

- Various documents provided by the project and other relevant ones were reviewed. From these documents, secondary information was obtained.

3.3 Study Limitation

There was one main limitation and that is because of time constraint, it was not possible to cover all the 33 pilot villages. However, the selection of sample villages (a total of 9) was done such that all Districts where the project is operating were covered as well as ensuring that well and poor performing villages were included.

4. FINDINGS OF THE ASSESSMENT

4.1 ACHIEVEMENTS COMPARED TO PLANNED TARGETS

The component initiated its activities during the year 1997/98. The areas of concentration being Mwanza region (Sengerema, Mwanza and Misungwi districts) and Mara region (Bunda, Musoma Rural and Tarime districts). During the first year, the main activities were: collection of information on the state of existing forest reserves, facilitation of villagers to earmark and protect forested and denuded areas in their villages, selection of tree nursery sites and mobilization of nursery materials, purchasing office and field equipment and provision of computer training to staff.

A mid-term review of LVEMP was conducted in February 1999. Among the decisions of the review mission with regard to Catchment Afforestation component were: moving the component office from Mwanza to Musoma and concentrating activities in Mara region due to limited resources and the fact that the region had less forestry projects compared to Mwanza and Kagera regions. The improved charcoal/firewood stove activity was also shelved (World Bank

1999). Consequently the component office was moved from Mwanza to Musoma in August 1999.

The main component activities have been: production of tree seedlings and field planting, natural forest conservation, natural forest reservation, forest rehabilitation monitoring, awareness arising and dissemination and capacity building. The component achievements as compared to planned targets are shown in Table 1. Table 1 shows that, overall, the catchment afforestation component either achieved or exceeded the planned targets. The techniques and strategies for the various activities undertaken by the component are discussed in the following sections.

Table 1: Catchment afforestation targets and status of implementation: 1997-2005.

Planned Target (with indicators)	**Status of Implementation/Activities achieved (with indicators)**	**Problems encountered**	**Corrective measures taken**
1. A total of 10 million tree seedlings raised and planted in pilot villages to protect the environment and improve community welfare by the end of the project *Indicator: Number of tree seedlings produced and planted*)	About 12 million tree seedlings have been raised in central and community based nurseries and planted by individuals, Institutions, NGOs and CBOs in pilot areas. Average survival rate is 79% (about 9 mill trees). The welfare of community groups involved in tree nursery micro projects has improved. Under commercial nursery system group members have managed to invest in other income earning activities like milling machines, vegetable gardens, water pumps for irrigation, modern houses and livestock *Indicator: number of surviving trees in farms/woodlots and community welfare*	(i) Uncontrolled fires killing planted trees. (ii) Livestock trampling and eating planted trees. (iii) Weak enforcement of village bylaws by some village leaders where animals have destroyed planted trees. (iv) Drought	(i) Woodlot owners urged to use thorny plants to fence their woodlots. (ii) Plant drought resistant species
2. Management of two existing forest reserves improved in the pilot area by the end of the project *Indicator: Number of well managed forest reserves*	Reconnaissance survey was carried out in all existing 36-forest reserves in Mwanza and Mara and their status established. Three priority forest reserves of Kyarano and Kyanyari in Musoma (R) and Kwirwirwi in Bunda districts were selected as pilot forests. Two of these namely Kyarano and Kyanyari have been put under Joint Forest Management (JFM) where four surrounding villages of Butiama, Rwamkoma, Nyamikoma and Mwibagi have	(i) Insufficient forestry staff (ii) Villagers surrounding government gazetted forests seeing the forests as belonging to outsider therefore not taking care of them	Put all forests under village management

	prepared management plans and bylaws for managing the forests. *Indicator: Number of forests with management plans*		
3. Five new village forest reserves created in the pilot area at the end of the project *Indicator: Number of new village forest reserves created*	Village communities in 10 pilot villages (Ilekanilo, Kasungamile, Ngoma B and Irunda in Sengerema, Kwibuse and Kuruya in Tarime and Kirumi, Bukabwa, Masurura and Ryamisanga in Musoma Rural) are looking after 6 natural forests surrounding them namely Magana (1448 Ha), Kigambabitare (620 Ha) Nyachina (333 Ha), Ilekanilo (15 Ha), Nyankulukulu (18 Ha) and Matale (6 Ha). *Indicator: Hectares of village forests put under community management*	None	None
4. Two village forests in the pilot area monitored throughout the life time of the project *Indicator: Number of monitored village forest reserves*	One village forest namely Kigambabitare (protected) and Mwitore (not protected) in Tarime district are being monitored for tree growth, species regeneration, forest damage and tree species diversity. A total of 60 Permanent Sample Plots (PSPs) have been established in the protected and 65 PSPs in the adjacent un-conserved forest as control. 8 Villages surrounding conserved forests are monitoring fire incidences, illegal tree cutting and encroachment in side. Fire incidences have been reduced from one incidence every year to zero over 3 years. Illegal tree cutting has stopped over three years. Animals like sykes, python, hyraxes, antelopes, and bird species have increased. *Indicator: Increased forest cover and reduced destruction*	Frequency of measurement is irregular as it depends on availability of inventory crew of Forestry and Beekeeping Division	In future to train and use district staff
5. Raise community awareness though meetings, workshops, seminars, radio and TV programs, newsletter articles and various other extension materials to 50 contact people per village in 33 pilot villages	• A total of 2370 people have been reached in 33 pilot villages. Inception workshops were conducted in 15 districts riparian to lake Victoria to make regional and district leaders, politicians, technicians NGOs, CBOs, and other	Resources were not adequate to conduct sufficient awareness meetings especially to livestock keepers who do not consider forest resources important	None

Indicator: Number of people practising one or more activities promoted by the project	stakeholders aware of the project • In all pilot villages of the component at least every homestead has planted trees. The number of people planting trees has increased every year. • Information have been disseminated through meetings, workshops, seminars and scientific fora. Other means of dissemination used are Project newsletter produced quarterly, booklets prepared by the component and radio and TV programmes and training sessions to community groups *Indicator: Level of community awareness*		
6. Local seed sources for different tree species established in pilot area by the end of the project *Indicator; Number of sites of different species identified/developed*	Over 20 community- woodlots have been established for future tree seed collection. *Number of seed sources/plus trees existing*	None	None
7. Prepare guidelines and regulations for managing natural forests implemented in the pilot area throughout the life time of the project *Indicator: List of guidelines and regulations in place*	• Dialogue meetings with surrounding villages have been made, boundary survey done and maps drawn for six village forests • The component used the guidelines prepared by the Forestry and Beekeeping Division to prepare 10 village forest management plans (for 4 villages surrounding Magana Village forest, in Musoma (R,) , 2 villages surrounding Kigambabitare village forest in Tarime district, 2 villages surrounding Kyarano forest reserve and 2 surrounding Kyanyari forest reserve in Musoma (R) district. • Bylaws are also used by villagers to manage the village forests • *Indicator: number of operational /management plans*	(i) Poor cooperation from some politicians eg Mang'ore sub village in Kirumi village (ii) Some forests are still encroached due to week village leadership	Dialogue/ awareness meetings with the politicians and village leaders conducted

8. Annual bush burning in all pilot forests controlled *Indicator: Reduction of incidents of bush fires compared with the initiation period*	Bush fires have been reduced in village-conserved forests from one incidence every year to average of one after three years *Indicator: Forest closing and new species emerging*	Some villagers still burned some forests	Urge to village governments to use existing bylaws
9. Capacity building improved *Indicator; Number of staff trained*	Two MScs, 12 short courses and 3 study tours involving staff and farmers conducted *Indicator: Improved work efficiency*	Some of the Staff trained under LVEMP went for jobs elsewhere	None
10. A component data base development *Indicator: Developed data base*	Misitu data base was developed in Microsoft Access programme *Indicator: Functional data base*	When computers were sent for major repair outside the component office some of the data got lost	Always make backup copies
11. A Component vision developed *Indicator; Developed vision*	Component vision was developed and harmonised with sister components of Kenya and Uganda. The vision reads: **"**Conserved forest/tree cover for sustained environmental and socio-economic benefits in the Lake Victoria ecosystem" *Indicator: Availability of catchment afforestation vision statement*	None	None

4.2 CATCHMENT AFFORESTATION ACTIVITIES

4.2.1 Production of Tree Seedlings

The component purchases seeds for planting from the Tanzania Tree Seed Agency (TTSA). Initially, some seeds were bought locally from uncertified sellers and this resulted in inferior trees. Local collection has therefore been suspended until the community woodlots established for future seed supply start producing seed.

Production of seedlings for planting as woodlots or on farm is done in central, commercial and individual nurseries. The total production to date is estimated at 12 million seedlings. Production of seedlings in central and commercial group nurseries commenced in 1998 and 1999 respectively. In the group commercial nurseries, in the first season, the project supports the groups with seeds, nursery materials, equipment and transport while the group members provide labour. The project also trains groups on nursery establishment and management before the nursery work commences. The project buys seedlings form the groups for distribution to communities at a cost of Tshs 100.00. During the following season, the groups are supposed to plough back part of the income in raising seedlings, and the project reduces support. Individual farmers also produce seedlings but these are not purchased by the project.

The project has carried out a production cost analysis of the three types of nurseries (Kimaro 2002). The study showed that individual nurseries cost Tshs 8.60 per seedling, central nurseries Tshs 89.90 and commercial nurseries Tshs 118.75. While central nurseries look cheaper compared to commercial group nurseries, often there are logistical problems associated with seedlings transfer to villages resulting in reduced seedling quality and field survival. This study led to a recommendation by the World Supervision Mission of February 2001, that in future private nurseries should be given more priority compared to others and that central nurseries can remain to be used for research and training purposes (LVEMP 2001b). Other development projects have also encouraged individual nurseries to get rid of the costly central nurseries (FRMP 1995). A further recommendation of September 2004 was to charge a token price for tree seedlings distributed in the catchments (LVEMP 2005a). After discussions with some villagers, a price of Tshs 20.00 was introduced (LVEMP 2005a). However the rate of buying seedlings was low, and consequently the remaining seedlings were given free of charge. Further sensitization and emergence of private nurseries and use of locally available materials would most likely make the seedling price affordable to communities.

4.2.2 Tree Planting and Management

Field planting of seedlings is done in individual or group woodlots and in individual farms. The main species planted include: *Grevillea robusta, Eucalyptus saligna, Acacia nilotica, Senna siamea, Mellea azaderach, Casuarina equisetifolia* and *Azadirachta indica*, while the following species have been planted to a limited extent: *Acrocarpus flaxinifolius, Khaya anthotheca, Cedrella ordorata,Terminalia ivorensis, Terminalia manthaly, Dovyaris caffra, Pithecelobium dulce, Markhamia lutea, Moringa oleifera* and *Albizia lebbeck*. Fruit trees include: *Psidium guayava, Mangifera indica* and *Persea Americana*. All the species except *Acacia nilotica, Khaya anthotheca, Markamia lutea* and *Albizia lebbeck* are exotic. Tree species performing well in the pilot villages include: *Mellea azaderach, Senna siamea, Acacia nilotica, Acrocarpus flaxinifolius* and *Albizia lebbeck*. There is a need in future to emphasize more planting of indigenous species trees and fruit trees in the LVB as well as nitrogen fixing tree species; the later will also improve soil fertility when planted in farms. During a field visit at Kwibuse village, one farmer complained that *Eucalyptus saligna* was negatively affecting food crop production, most likely due to allelopathy and competition for nutrients and soil moisture. Other species found to negatively affect food crops are: *Senna siamea* and *Mellea azaderach*. Competitive species should be limited to monoculture planting in marginal areas. Great care is needed in the selection of exotics as some of these are considered in other countries to have negative hydrological effects or have become invasive (Chamshama & Nwonwu 2004).

Field espacement was observed to vary from 2 x 2 m to 5 x 5 m. Often for the marginal sites, closer spacing was associated with retarded growth due to below ground competition for moisture and nutrients. There was significant variation in site preparation and tending. Some sites were well prepared before planting while others were only spot prepared. The same applied to weeding, some sites were totally weeded, others spot weeded and some received no weeding at all.

The intensity of site preparation and weeding was reflected in tree performance. The higher the intensity the higher the growth. Some communities intercropped their trees with food crops, and this ensured that the trees were weeded alongside food crops. Intercropping should be encouraged in future as this will ensure that trees are weeded, during the peak season when labour is directed to agricultural activities. Poor management of some community woodlots was noted due to various reasons like weak leadership and individual commitments out-weighing group commitments. Members could consider dividing the plots among themselves. This may improve care of the plots as well as ownership when groups break-up.

Ownership issues for the woodlots are now being sorted out, with village governments issuing letters of land offers, which is a prerequisite for the district land offices to the survey the areas and process title deeds (LVEMP 2005). This clears ownership concerns with respect to planted trees. Villages should also use land use plans for allocating plots for establishment of woodlots as current allocation looks arbitrary.

Termite problems especially on Eucalyptus and Grevillea species have been reported and observed in nearly all villages visited. As use of insecticides will pollute the lake, the best option is to plant termite resistant indigenous and exotic species. Livestock was damaging some trees. Most villages have relevant by-laws but often offenders have been left without any fines. Close relations between family members contribute to no action.

Some of the species are not growing well due to offsite planting. At Bwiregi primary school for example, teachers complained of poor growth of *Grevillea robusta* despite good tending. The site is fairly dry and rocky and not suitable for the species. Species-site matching is critical to ensure increased productivity.

4.2.3 Management of Natural Forests

The catchment afforestation component has assisted the survey, boundary demarcation and mapping of six potential village forests reserves (Ilekanilo 15 ha, Nyankulukulu 18 ha, Matale 6 ha, Nyachina 333 ha, Kigambabitare 620 ha, and Magana 1448 ha). The communities surrounding these forests have also with the assistance of the component staff prepared by-laws and simple management plans for managing the forests. One of these forests was visited (Kigambabitare), and the forest show clear signs of recovery, and communities now complain of wildlife damage. The forest after recovery now harbours various types of wildlife. Other than conservation of village forest reserves, in-situ conservation of other degraded lands has not received much attention. This is a cost-effective technique and has been used successfully by the *Hifadhi Ardhi Shinyanga (HASHI)* project in Shinyanga region. Through in-situ conservation, 70% of the households in the region have been able to re-establish their traditional *ngitili* system of land management covering over 350,000 ha with huge dividends both for the natural environment and the livelihood of the communities (MNRT 2002).

Reconnaissance survey was carried out in all existing 36-forest reserves in Mwanza and Mara and their status established. Three priority forest reserves of

Kyarano and Kyanyari in Musoma (R) and Kwirwirwi in Bunda districts were selected as pilot forests. Two of these namely Kyarano and Kyanyari have been put under Joint Forest Management (JFM) where four surrounding villages of Butiama, Rwamkoma, Nyamikoma and Mwibagi have prepared management plans and bylaws for managing the forests. There is however need to develop equitable cost-benefit sharing mechanisms in JFM.

During field work, many bicycles loaded with charcoal and firewood were found in early mornings, evenings and night ferrying the goods to the urban communities. Discussions with communities in the visited villages showed that weak leadership and inadequate awareness raising seem to explain the continuing deforestation taking place. Further awareness raising and establishment/effective use of village natural resources committees and village leaders to control illegal harvesting/over harvesting should be sought.

4.2.4 Forest Rehabilitation Monitoring

The Catchment Afforestation component has established Permanent Sample Plots (PSP) in a well-conserved forest (Kigambabitare - 60 PSPs) and in an unreserved forest (Mwitore – 65 PSPs) to compare forest improvement due to reservation. Also three run-off plots each for the reserved and un-reserved forest have been established for assessing run-off and soil erosion. These PSPs and run-off plots will provide quantitative data and serve, as a good demonstration to communities as seeing is believing.

4.2.5 Awareness Raising and Dissemination

Awareness raising workshops were conducted to all district leaders, technicians and politicians of the 15 districts where LVEMP is operating. As a result of this, the component is enjoying political support in the pilot districts. Awareness raising workshops were also held in the pilot villages, and all farmer groups were trained on nursery establishment and management techniques. There is a manual on nursery establishment and management prepared by the project. During field visits, it was clear that communities today consider catchment afforestation beneficial to their livelihoods and environment. They now positively view trees and nearly all communities in the pilot villages have trees in their farms or woodlots. However, as pointed out in section 4.2.3, awareness raising is generally considered inadequate, as this was done for the pilot villages during component inception in the villages, and later by training of community nursery groups on nursery and field establishment and management. Awareness raising should be a continuous process and should involve a variety of methods. The *HASHI* project for example increased environmental awareness among the Shinyanga communities by sensitising them regularly through a variety of methods like: participatory rural appraisal (PRA), video and film shows, study visits, farmer to farmer visits, traditional *ngoma* and theatre arts, publications (posters, newsletters, books), meetings, workshops, seminars, exhibitions, demonstration plots, youth camps and school excursions (HASHI 2002). Generally, the methods were very effective and significantly contributed to the adoption of agroforestry practises (e.g. homestead tree planting, on-farm tree conservation/planting, boundary planting, fodder banks, improved fallows and rotational woodlots), nursery establishment, *in-situ* conservation (*ngitili*),

beekeeping, management of catchment areas and improved cook stoves (HASHI 2002)

4.2.6 Capacity Building

Capacity building for staff involved study tours (3), graduate training (2 M.Sc's) and 11 short courses. Overall the courses have improved the capacity of the staff in various aspects of natural resource management.

4.2.7 Monitoring and Evaluation

Monitoring is an internal management tool and is an integral part of project implementation. Monitoring involves a continuous assessment of activities against work plan as well as resources against design. The main objective is to identify problems and bottlenecks in order to take corrective action. Monitoring is a four-step process: recording data on key indicators, analysis of data, reporting, storage of data and information.

Monitoring of project activities is currently carried out by regular/irregular visits to the villages by Catchment Afforestation component staff. In August each year, component staff visit a sample of villages and farmers to count plant survival. In other cases attention is mainly directed to the manner things have been done and provide advise on corrective measures. Generally monitoring has been inadequate. As noted during field visits, the management of some of the woodlots would have been better if there was continuous monitoring and provision of feedback. Quantitative records of achievements of various activities in the villages are important for later evaluation. Farmers if given the training and the forms to be filled could collect these records.

Also socio-economic studies to monitor changes that occur over time after the interventions have been introduced so as to assess adoption and impact are important but have not been done. These act as a follow-up of the baseline survey data if collected.

4.2.8 Infrastructure

The component uses a building it renovated in 1999, owned by the Government. The component has several office and field equipment. A shortfall of the following items was indicated: lorry for seedlings transport and patrols, still camera, video camera and audio-visual aids.

4.3 INTERVENTIONS TESTED AND APPROACHES USED

The Catchment Afforestation component has been testing two main interventions namely promotion of tree planting in monoculture or intercropping (agroforestry) and natural forest management. In both of these interventions, the component has been working with communities from planning to implementation. The problems observed during implementation of these interventions have been discussed in the previous section. The outcomes of the tested interventions could have been higher if: the Catchment Afforestation and Soil and Water Conservation components were working in the same villages, a catchment

approach was used and paraprofessionals were used as elaborated in the following paragraphs.

Improvement in water quality of the Lake Victoria depends largely on the successful implementation of afforestation, and soil and water conservation activities, which aim at controlling soil erosion to reduce siltation and eutrophication. Thus, technically, these two components complement each other but currently work together only in two pilot villages. It is therefore recommended that the two components should work together during LVEMP phase II for greater results and impact.

Rather than using village boundaries to demarcate areas for intervention as done by the Catchment Afforestation component, a catchment approach considers the topographic features and their effect on local hydrology and sediment production. A catchment/watershed is defined as an area with several streams that drains water into a common drainage. It includes hilltops, slopes, valley bottoms and natural drainage. The catchment approach has successfully been used in the forest resources and soil and water conservation of the Usambara mountains by the Soil Erosion Control and Agroforestry Project (SECAP) (Kizughuto & Shekukindo 2005) and other projects in the country (FRMP 1995).

Given the increasing interest in tree planting and management of natural forests, and the need to scale up during phase II, the component should adopt the strategy of training farmers as trainers who then train other farmers in their villages. The trained farmers can then reach as many people as possible in their own villages. Their contributions will sustain even if project funding is phased out. The Buhemba Rural Agricultural Centre (BRAC), in Musoma Rural district, already uses this strategy. The BRAC does not pay any salary to the trained farmers, but gives incentives like bicycles and boots. This is a cost-effective strategy especially given the limited extension staff in the villages due to retrechments etc. This approach also called the training of Paraprofessionals or Voluntary Extension Workers (VEW), or Farmer Motivators has been successfully used in some development projects in Tanzania (Chamshama & Kilasile 2001). The main reasons of training Paraprofessionals/VEW/Farmer Motivators include:

- Unsatisfactory coverage and quality of extension services at village level. Factors contributing to the low quality of extension services include: level of education, remuneration and working conditions.
- It is unlikely that Governments will have sufficient resources to train and deploy extension staff in each village/community.
- Move extension services to as close to the farmer as possible.
- Building up farmer's capacity to sustain activities in case project support is scaled down or removed.
- Facilitate technological transfer and networking among farmers in pilot villages.

4.4 CONTRIBUTION OF CATCHMENT AFFORESTATION TO THE COMMUNITY AND ENVIRONMENT

In all the villages visited, communities acknowledged that the Catchment Afforestation component through awareness raising, support to seedlings production and management of natural forests have all made them consider forest resources much more important to them and the environment. There are clear vegetation changes in protected forests and today even harbour wildlife, forest fires are much less, some streams which were dry are now seen with water and there is less wind damage to buildings. The demand for seedlings has been increasing over the years. For those in commercial nursery groups, seedlings sales have enabled them to meet various costs and investments like construction of houses, purchase of milling machines, establishment of vegetable gardens, purchase of water pumps for irrigation, school fees, purchase of cattle etc. From the foregoing, it's obvious that the Catchment Afforestation activities have contributed to major governmental environmental and socio-economic policies (MNRT 1998, Planning Commission 2000, PRSP 2000, VP 1997). However as pointed out in section 4.2.5, awareness raising has not been very effective due to the continuing deforestation for charcoal and firewood noted during field visits. In some villages, neither the communities nor the village leadership seem concerned.

For those with trees, benefits from sales of the planted trees will come much later. Other income generating activities like beekeeping, would enable them get some income from sales of honey and bees wax while waiting for the trees to mature for sale as firewood, poles etc.

4.5 COLLABORATION

4.5.1 Intra and Inter-Component Collaboration

The Catchment Afforestation component activities are handled by a total of nine staff, three of these are LVEMP staff while the rest are district council staff. The task leader gives guidelines and there are regular meetings to discuss planned activities before they are implemented. There used to be monthly extension meetings but these have been stopped due to funding constraints.

At inter-component level, there are three monthly project implementation committee meetings where component coordinators and task leaders discuss progress, constraints/impediments, and future plans. Also there are annual planning meetings involving all components.

Four components: catchment afforestation, soil and water conservation, water quality and ecosystem management are participating in the integrated components management of Kwibuse micro-catchment by working together in approaching communities, carrying out interventions and data collection.

Overall, intra and inter-component collaboration is considered satisfactory. However, as pointed out earlier, there could have been higher impact if the catchment afforestation and soil and water conservation were working in the same pilot villages using the catchment approach.

4.5.2 Other Programmes in the Lake Victoria Basin and Extent of Collaboration

The LVEMP Catchment Afforestation component maintains some informal collaboration with other natural resource management programmes in the LVB. These include the District Development Programme (DDP) funded by the Swedish International Development Agency (Sida), World Wildlife Fund (WWF) funded by the Norwegan Agency for Development cooperation (NORAD), Sustainability for Victoria Fishing and Farming (VIFAFI) funded by Austria KNB, Buhemba Rural Agricultural Centre (BRAC) funded by Anglican church donors and Vi-Agroforestry funded by Swedish volunteers. Collaboration has mainly been in form of assisting with seedlings, exchange of publications, participation in meetings and technical advice. There is a forum in Mara Region called Mara Development Forum. The forum holds regular meetings to discuss rural development issues, but there is limited participation in meetings by the major players in forest resources and soil and water conservation.

4.6 PROBLEMS AND CONSTRAINTS

Not withstanding the significant achievements recorded so far, the project faces a number of constraints/impediments. The major constraints/impediments pointed out by stakeholders are:

- **Financial resources:**
  As pointed out in the Aide Memoire of April 2004, improvement of water quality of Lake Victoria depends largely on the successful implementation of afforestation and soil and water conservation activities, which aim at controlling soil erosion to reduce siltation and eutrophication. However, these components have received inadequate attention in terms of prioritized actions and budget allocations (AM 2004). In some cases there were also delays in release of funds which affects timely implementation of planned activities (LVEMP 2005b).

- **Staff shortage and poor remuneration:**
  The Catchment Afforestation component uses staff seconded by the central government as well as those of the local government in the districts. At present these total 9, and are at the Musoma catchment afforestation office or district headquarters. There are no technical staff at Division or Ward level. The limited number of staff makes implementation and monitoring of activities a major constraint. Also poor remuneration of civil servants has lead to poor motivation thereby negatively affecting output (LVEMP 2000).

- **Termite problems:**
  Termite problems especially on Eucalyptus and Grevillea species have been reported and observed in nearly all villages visited. As use of insecticides will pollute the lake, the best option is to plant termite resistant indigenous and exotic species.

- **Livestock damage to seedlings:**
  Livestock was damaging some trees. Most villages have relevant by-laws but often offenders have been left without any fines (LVEMP 2000). Village leadership should effectively use by-laws.

- **Fire damage:**
  Some planted trees or conserved natural forests are sometimes damaged by fires, despite the presence of by-laws in some villages (LVEMP 2000). Village leadership should effectively use by-laws.

- **Poor species-site matching:**
  Some of the species are not growing well due to offsite planting. At Bwiregi primary school for example, teachers complained of poor growth of *Grevillea robusta* despite good tending. The site is fairly dry and rocky and not suitable for the species. Species-site matching is critical to ensure increased productivity.

- **Prolonged drought:**
  In some years, prolonged drought led to low seedling survival (LVEMP 2001c) or delay in planting and overstay of tree seedlings in nurseries (LVEMP 2005b). Planting of drought resistant species should be emphasized.

5. LESSONS LEARNT, CHALLENGES AND KEY EMERGING ISSUES

From this review, there are a number of important lessons that provide the basis for recommendations to guide the way forward in catchment afforestation of the LVB. The following lessons are noteworthy (Table 2):

Table 2. Key issues and lessons learnt in the catchment afforestation component, LVEMP

Issue/Activity	Lessons Learnt	Recommendation
The catchment afforestation as a priority component	Improvement of water quality in the lake depends on successful rehabilitation of the basin to control soil erosion and reduce siltation and eutrophication. However, the component has received inadequate attention in terms of prioritized actions and budget allocations	The component should be accorded higher priority and budget during LVEMP II
Inter-component collaboration	There could have been higher impact if the catchment afforestation and soil and water conservation were working in the same pilot villages using the catchment approach	The catchment afforestation and soil and water conservation components should work in the same villages and use the catchment approach.
Production of seedlings	Production cost of seedlings is much lower in individual nurseries, followed by central	In future, private nurseries should be given more priority

	nurseries and commercial private nurseries	
Tree establishment and management	Tree survival and growth depended on species-site matching and intensity of cultural techniques	Species should be matched to site and preference should be given to suitable indigenous species as well as N-fixing species. Intercropping should be encouraged. Indigenous and exotic fruit trees should also be encouraged as well as in-situ conservation of degraded lands
Community participation	Community involvement in schools, prisons, individuals and groups proved to be an effective method of implementing various component activities. In some situations group woodlots were poorly managed	Future emphasis should be on individual woodlots
Awareness raising/dissemination	Awareness raising is considered inadequate as deforestation and land degradation is continuing even in some pilot villages	Awareness raising should be a continuous process and should involve a variety of methods
Joint Forest Management	Distribution of benefits and costs under JFM has not yet been resolved. Long-term sustainability of JFM is contingent upon its ability to generate adequate benefits to its members.	The government and stakeholders should develop equitable cost-benefit sharing mechanisms under JFM
Monitoring and evaluation	Monitoring of project activities has in most cases been irregular. Continuous monitoring and evaluation of farmers' activities and provision of feedback is crucial in project activities as it enhances adoption and farmers are motivated to perform	Future monitoring and evaluation should be continuous
Collaboration with other relevant programmes	Absence of/Inadequate collaboration with other relevant programmes results in lost opportunities in terms of harmonizing strategies/approaches	There should be mechanisms for closer collaboration with other relevant programmes

6. WAY FORWARD AND RECOMMENDATIONS FOR THE FUTURE

6.1 Way Forward

The way forward for the component is up scaling of the pilot activities to all the three regions (Kagera, Mara and Mwanza) as the problem of deforestation and land degradation is still high in the LVB, and the current coverage is still insignificant. There are several challenges/key issues which have to be resolved to make the up scaling a success. The recommendations in the following section arise from the challenges/key issues discussed in this report.

6.2 Recommendations for the Future

The following are the main recommendations for consideration during the second phase of the project:

Priority and Budget for the Component

- The component should be accorded higher priority and budget during LVEMP II. The component should therefore become a core component.

Catchment Approach to Natural Resource Management and Conservation

- The catchment afforestation (should be renamed catchment management) should work together in the same villages with the soil and water conservation and should use the catchment approach.

Production of Seedlings

- In future, private nurseries should be given more priority. Communities should be assisted with improved seeds and polythene pots, and should sell seedlings among themselves instead of the project buying and reselling to other communities without nurseries. Use of locally available materials should be encouraged.

Tree Establishment and Management

- Species should be matched to site and preference should be given to suitable indigenous species as well as N-fixing species. Intercropping should be encouraged. Indigenous and exotic fruit trees should also be encouraged. In-situ conservation of degraded areas should also be emphasized.

Paraprofessionals/Village Extension Worker/Farmer Motivators

- Relevant LVEMP components should adopt the strategy of training farmers as trainers during scaling up.

Awareness Raising

- Awareness raising should be a continuous process involving all village members and should use a variety of methods.

Monitoring and Evaluation

- The component should design simple monitoring forms and train selected farmers how to use them.
- There should be socio-economic studies to monitor changes that occur over time after the interventions have been introduced.

Joint Forest Management

- The government and relevant stakeholders should develop equitable cost-benefit sharing mechanisms under JFM.

Alternative Income Generating Activities

- Alternative income generating activities like beekeeping should be included.

Improved Firewood/Charcoal Stoves

- This activity was shelved during LVEMP I. It should be included in the second phase.

Collaboration with other Relevant Programmes

- There should be mechanisms for closer collaboration with other relevant programmes.

7. CONCLUSIONS

For each output, the catchment afforestation component had set indicators of achievement. Overall the component as per the set targets and indicators has performed extremely well. Within the short period of the component existence, communities and other stakeholders have raised and planted trees, and are protecting their natural forests. The discussions in the villages clearly show that communities are now much more aware of the benefits of forests to the environment and livelihood than before.

However despite these achievements, the LVB is still facing serious deforestation and land degradation. The main challenge of the component is to scale-up and cover all the regions of the basin. This challenge can be easily overcome if the proposed recommendations are effectively implemented.

ACKNOWLEDGEMENTS

I wish to thank LVEMP Regional/National Executive Secretary Mr. C. Nyirabu and his staff for recommending my appointment to Ministerial Tender Board to undertake this consultancy on lessons learnt on catchment afforestation afforestation. I also thank Mr. Ngatara A. Kimaro, the Task Leader for making the initial contacts concerning the assignment.

I am grateful to Mr. Ngatara A. Kimaro, Mr. Paul Mutongore and Mr. Jonathan A. Mmbaga for being available for often lengthy discussions, and joining me during field visits, which were even done in weekends.

I wish to thank officials of other Programmes and Farmers I met during field visits for their time and information availed to me.

While I acknowledge with thanks all those who availed information during the study, I am however solely responsible for any omission and errors of interpretation.

REFERENCES

AM 2004. Lake Victoria Environmental Management Project, Tanzania-Credit No 2908, Implementation review, April 19-26, 2004. Aide memoire. 24 pp.

Chamshama, S.A.O & Kilasile, C.K. 2001. Training needs assessment and human resource development plan, MEMA Project, Iringa, Tanzania. A consultancy report. 44 pp.

Chamshama, S.A.O. & Nwonwu, F. 2004. Case studies on forest plantations in Africa. FAO/KSLA/AFORNET. 95 pp.

FRMP 1995. Identification of best practices for forest activities. Forest Resources Management Project, FDB, MNRT, Dar es Salaam, Tanzania.

HASHI 2002. The Blooming Degraded land – HASHI Experience 1986/87 – 2002 (First Draft), Forestry and Beekeeping Division, Ministry of Natural Resources and Tourism. 97 pp.

Kaoneka, A.R.S. 2000. A review of forest land management: Retrospects and Prospects. FORCONSULT, SUA, Morogoro, Tanzania. 74 pp.

Kimaro, N.A. 2002.Catchment afforestation completion report. LVEMP, Musoma, Tanzania. 11 pp.

Kizughuto, T.M. & Shekukindo, H.B. 2005. The challenges facing the catchment approach in the East African highlands: The case of Usambara mountains: experiences and way forward. Workshop paper, SECAP, Lushoto, Tanzania. 37 pp.

World Bank 1999. Lake Victoria Environmental Management Project (LVEMP): Tanzania mid-term review mission draft Aide Memoire. 27 pp.

LVEMP 2000. Catchment afforestation: constraints, recommendations and future plans. Regional/National Secretariat, Dar es Salaam. 3 pp (Extracted from a larger document not seen by the Consultant).

LVEMP 2001a. Draft workplan and budget estimates for financial year 2001/2002. Regional/National Secretariat, Dar es Salaam. 81 pp.

LVEMP 2001b. Implementation status of recommendations made during the World Bank supervision mission of 12th to 23rd February 2001. Regional/National Secretariat, Dar es Salaam. 51 pp.

LVEMP 2001c. Implementation status of recommendations made during the World Bank supervision mission of 14th to 28th February 2000. Regional/National Secretariat, Dar es Salaam. 68 pp.

LVEMP 2005a. Status of implementation of Aide Memoire recommendations by World Bank supervision mission of September 2004. Regional/National Secretariat, Dar es Salaam. 21 pp.

LVEMP 2005b. Progress report since the last review mission (September 2004) prepared for the World Bank supervision mission to Tanzania 20th to 26th April 2005. Regional/National Secretariat, Dar es Salaam. 32 pp.

MNRT 1998. National Forest Policy. Ministry of Natural Resources and Tourism, Dar es Salaam. 59pp.

MNRT 2001. Woodfuel consumption in selected urban areas of Tanzania. Dar es Salaam, Tanzania. 118 pp.

MNRT 2002. Terms of Reference for the Establishment of A National Resource and Competence Centre for Agroforestry Management and District Development HASHI and HASHI/ICRAF Projects (MNRP, TAN 092), Forest and Beekeeping Division. 4 pp.

NBS 2002. Household budget survey 2000/01. National Bureau of Statistics. Dar es Salaam, Tanzania. 180 pp.

Planning Commission 2000. Composite development goal for the Tanzania development vision 2025. United Republic of Tanzania, Dar es Salaam. 140 pp.

PRSP 2000. Poverty reduction strategy paper. United Republic of Tanzania, Dar es Salaam. 63 pp.

VP 1997. National Environmental Policy. Vice Presidents Office, Dar es Salaam. 41pp.

ANNEX 1: TERMS OF REFERENCE

1. Background

Lake Victoria Environmental Management Project (LVEMP I) is a regional project implemented by the three East African Countries of Kenya, Uganda and Tanzania.

Catchment Afforestation is one of several components of LVEMP I implemented by the Forestry and Beekeeping Division in the Ministry of Natural Resources and Tourism in collaboration with Natural Resources/Forestry Departments in District Councils.

The long-term development objectives of LVEMP are to:

- Maximize the sustainable benefits to riparian countries from using resources within the basin to generate food, employment and income, safe water supply and sustain a disease free environment.
- Conserve biodivesity and genetic resources for the benefit of riparian and global communities.

The first phase of the project was set to achieve the following:

- To provide the necessary information, to improve management of the lake ecosystem.
- To establish mechanisms for Cooperative management by the three countries.
- To identify and demonstrate practical, self-sustaining remedies, while simultaneously build capacity for ecosystem management.

The Objective of Catchment Afforestation is to improve vegetation cover in the catchment areas of the lake by taking appropriate forest management interventions including protection of existing forests, tree seedling production and tree planting with full involvement of communities.
The component is set to contribute to the two long term development objectives mentioned above and objectives (a) and (c) of the existing phase.

During LVEMP I the sub-component was expected to address the following issues: protection of vital parts of the lake catchment by planting trees, increase awareness among communities on catchment protection and tree farming, develop local seed sources, improve management of existing forest reserves, create new forest reserves and conserve biodiversity.

As the project is coming to an end (December 2005), it is important that the lessons learned during the last seven years of the project implementation be documented as background information for preparation of LVEMP II. It is on this basis that the project wishes to engage a national consultant to produce the report.

2. The objective of the Consultancy

- To review what has been done by Catchment Afforestation sub-component, its outputs, outcomes and impact for the last seven years of LVEMP 1.
- To review the extent to which catchment Afforestation activities have met project objectives and the major Government environmental and socio-economic policies. e.g. environmental conservation, poverty alleviation, gender balance, community participation, economic gain, etc.
- To get a package of information that will be used in the preparation of project completion report, preparation of LVEMP II, and assist policy makers and decision-makers in making proper management decisions.

3. Scope of Work

- Document in detail the various Catchment Afforestation activities and the extent to which they have contributed to the project objective.
- Review the interventions tested and approaches used in pursuing the sub-component objectives and their effectiveness.
- Review issues that would have been addressed but were not.
- Review the contribution of Catchment Afforestation to community and the environment.
- Review intra- and inter-component collaboration and coordination.
- Review community behavioral change towards tree planting and natural forest conservation after seven years of the project operation.
- Review the other partners/programs complementary to the sub-component activities in the lake basin.
- Review problems/constraints encountered in the implementation of the sub-component activities.
- Based on the above draw detailed lessons of experience learned (both positive and negative) and their underlying factors.
- Propose possible replication of the positive approaches to other areas within or outside the lake basin and why?
- Suggest methods to be avoided and new ideas to be tested in future for sustainability of the program.

4. Methodology

- Desk reviews.
- Interviews.
- Field verification.

5. Work Plan

The consultant should prepare his/her timetable of schedule of activities, which should take a maximum of 30 days. It should not necessarily be a continuous one, but the report should be ready for discussion in National workshop to be held mid August 2005.

6. Deliverables

- Inception report.
- Draft final report
- National workshop report
- Final report

7. Qualifications

- The consultant should have a minimum of MSc in forestry related studies.
- A previous work done on Environmental Management aspects in the lake Victoria basin will be an added advantage.

ANNEX 2: LOGICAL FRAMEWORK ANALYSIS: CATCHMENT AFFORESTATION

1. Introduction

Catchment Afforestation is one of Lake Victoria Environmental Management Project implemented under Forestry and Beekeeping Division in the Ministry of Natural Resources and Tourism.

The purpose of the component is to improve management of both public and Reserved Forests in the lake Victoria Catchment by involving surrounding communities and strengthening extension services.

Issues being addressed include: Protection of vital parts of the lake by planting trees, increasing awareness among communities on catchment protection and tree farming, developing local seed sources, improving management of existing forest reserves, creation of new forest reserves and conservation of forest biodiversity.

2. Background Information:

There has been severe degradation of forested land in the lake Victoria catchment, which has rendered the lake environment unstable. The catchment areas of the lake are being severely depleted of forests by human activities like: land expansion for agriculture, overgrazing, annual wild fires, improper agricultural practices, and overuse of forest products. This depletion is extended to areas very prone to environmental degradation like steep slopes, hills, riverbanks and swamps**.** The resources available in District Councils and Forestry Department in terms of manpower, finance and other resources are not sufficient to implement required forest conservation and development. For this case LVEMP was initiation to reduce these problems.

3. Expected Outputs

- A total of 10 million trees planted by the end of the project.
- Public awareness in managing natural forests raised by 30% in three pilot districts by the end of the project.
- Local seed sources of all tree species promoted by LVEMP established in pilot villages by the end of the project.
- Guidelines and regulations developed by Forestry Dept for managing natural forests implemented in all pilot villages in the life time of the project.
- Capacity building improved.
- Bush burning reduced by 30% from the present situation by the end of the project.
- Component data base developed by the end of the project.

4. Planned Activities

(i) Nursery establishment and tree planting

- Identify suitable sites to establish tree nurseries.
- Procure nursery tools and materials.

- Produce tree seedlings.
- Promote tree planting.

(ii) Management of Existing Forest Reserves

- Carry out reconnaissance survey to establish the status of 36 forest reserves in Mwanza and Mara regions.
- Prioritize the forest reserves and select pilot forests.
- Conduct dialogue meetings with surrounding villagers to prepare management agreements.
- Facilitate implementation of management agreements.

(iii) Creation of New Forest Reserves

- Carry out reconnaissance survey to identify potential areas to be protected as village forest reserves.
- Prioritize the areas.
- Identify surrounding villages.
- Initiate dialogue meetings with villagers surrounding the earmarked areas.
- Carry out village forest boundary surveys.
- Produce topographic maps of created village forests.
- Facilitate preparation of village forest management plans.
- Facilitate implementation of village forest management plans.

(iv) Monitoring of village forests

- Establish permanent sample plots to measure forest changes in conserved forests.
- Follow up implementation of village forest management plans.
- Establish surface run off plots to measure soil erosion from conserved forests.
- Collect data from sample plots.

(v) Awareness raising

- Conduct inception workshops to make stakeholders aware of the project.
- Prepare teaching materials for awareness raising.
- Conduct workshops and seminars to stakeholders.
- Disseminate information to stakeholders.

(vi) Establish local seed source

- Identify localities with suitable trees (plus trees) for local tree-seed collection.
- Facilitate establishment of community-based wood lots which will be used for future seed sources.
- Facilitate training of community groups on local seed collection.
- Collect tree seeds locally.

(vii) Develop Guidelines and regulations for managing natural forests

- Collaborate with Forestry Dept to develop guidelines for managing natural forests.

(viii) Strengthen extension services

– Conducts short and long-term staff training.
– Conduct study tours to staff and farmers.

(ix) Bush Burning Controlled

– Facilitate pilot villages to make bylaws.
– Facilitate communities to prepare fire lines around wood lots and protected forests.

(x) Data base development

– Develop component data base.

(xi) Develop Catchment Afforestation Vision

– Conduct stakeholders workshop to prepare component vision.
– Harmonize developed vision with the sister components of Kenya and Uganda.

(xii) Office Management

- Facilitate acquirement of an office for the component.
- Facilitate office running.

The detailed plan is put in log frame matrix as shown in Table 1.

Table 1. A Logical Framework Matrix - Catchment Afforestation

Narrative Summary	**Measurable indicator**	**Means of Verification**	**Important Assumptions**
Goal:			
(= of LVEMP)			
Purpose:			
To improve management of both public and forest reserves in the lake Victoria catchment	Number of well managed planted and natural forests	Project completion and supervision reports	Weather will remain favourable, community will be willing and funds will be available
Outputs:			
1. A total of 10 million tree seedlings raised and planted in pilot villages by the end of the project	Number of tree seedlings produced and planted	Quarterly and annual reports	Availability of funds and Community will
2. Management of two existing forest reserves improved in the pilot area by the end of the project	Number of well managed forest reserves	Annual reports	Community will
3. Five new forest reserves created in the pilot area at the end of the project	Number of new village Forest Reserves created	Annual reports	Community will
4. Two village forests in the pilot area	Number of	Annual	Availability of

monitored throughout the life time of the project	monitored village forest reserves	reports	funds
5. Community awareness in pilot villages raised throughout the life time of the project	Number of people practising on or more activities promoted by the project	Annual reports	Community will
6. Local seed sources for different tree species established in pilot area by the end of the project	Number of sites of different species identified/developed	Annual reports	Community will
7. Existing guidelines and regulations for managing natural forests implemented in the pilot area throughout the life time of the project	List of guidelines and regulations in place	Copies of guidelines	Community will
8. Bush burning in all pilot forests controlled	Reduction of incidents of bush fires compared with the initiation period	Forest inventory reports	Community will
9. Capacity building improved	Number of staff trained	Available certificates	Availability of funds
10. A component data base development	Developed data base	Annual reports	Availability of data base expert
11. A Component vision developed	Developed vision	Vision workshop report	Community will
Activities:			
1.1 Identify suitable sites to establish tree nurseries in three districts in Mwanza and three districts in Mara.	Number of sites secured	Annual reports	Availability of water
1.2 Procure nursery tools, equipment and materials	Number of tools and equipment procured	Annual report	Availability of funds
1.3 Produce tree seedlings in central and community based nurseries	Number of tree seedlings produced	Annual reports	Availability of funds
1.4. Plant trees	Number of trees planted	Annual reports	Community will
2.1 Carry out reconnaissance survey to establish the status of 36 forest reserves in Mwanza and Mara	List of forest reserves and their status	Survey report	Availability of funds
2.2 Prioritize the forest reserves and select pilot forests	Number of priority forest reserves	Annual reports	Community will
2.3 Find the list of villages surrounding the forest reserves	List of villages	Survey report	Community will
2.4 Conduct dialogue meetings with surrounding villages to prepare	Number of meetings	Annual reports	Community will

management agreements	conducted and management plans prepared		
2.5 Facilitate implementation of management agreements	Number of forest reserves under joint management	Annual reports	Community will
3.1 Carry out reconnaissance survey in villages bordering Mwanza gulf & river Mara to identify potential areas to be protected as village forest reserves	Number of identified village forest reserves	Annual reports	Fund availability
3.2 Prioritise the areas for protection	Number of priority areas	Annual reports	Community will
3.3 Find out the list of villages surrounding the priority areas	List of surrounding villages	Survey report	Community will
3.4 Initiate dialogue meetings with villagers surrounding the priority areas	Number of dialogue meetings conducted	Annual reports	Community will and availability of Fund
3.5 Carry out village forest boundary surveys	Number of village forests surveyed	Survey reports	Availability of funds
3.6 Produce topographic maps of created village forests	Number of topographic maps produced	Produced maps	Availability of funds
3.7 Facilitate preparation of village forest management plans	Number of village forest management plans produced	Management plans	Community will
3.8 Facilitate implementation of village forest management plans	Number of villages implementing management plans	Annual reports	Community will
4.1 Establish permanent sample plots to measure forest changes in conserved forests	Number of Permanent Sample Plots established	Inventory reports	Availability of funds
4.2 Establish surface run off plots to measure soil erosion from conserved forests	Number of surface run off plots established	Annual reports	Availability of funds
4.3 Collect data from sample plots	Collected data	Annual reports	Community will
4.4 Analyze collected data	Number of reports produced	Annual reports	Availability of experts
5.1 Conduct inception workshops in 15 districts bordering the lake to make stakeholders aware of the project	Number of workshops conducted	Workshops reports	Political will and availability of funds
5.2 Prepare teaching materials and disseminate to stakeholders for	Number of teaching	Copies of teaching	Availability of funds

awareness raising	materials prepared	materials	
5.3 Conduct awareness workshops and seminars to village stakeholders	Number of workshops and seminars conducted	Annual reports	Political will and availability of funds
6.1 Identify localities with suitable trees (Plus trees) for local tree-seed collection	Number of sites of different spp identified	Annual reports	Community will
6.2 Facilitate training of community groups on tree seed collection	Number of staff trained on computer course	Available certificates	Availability of funds
6.3 Collect tree seeds locally	Number of tree seed kgs collected	Annual reports	Community will
7.1 Implement the existing guidelines and regulations prepared by Forestry and Beeekeeping Division	Number of prepared village forest management plans	Copies of produced management plans	Availability of funds and community will
8.1 Facilitate pilot villages to make forest bylaws	Number of villages with bylaws	Annual reports	Community will
8.2 Encouraging communities to establishment fire lines around wood lots and protected forests	Length of fire lines made	Annual reports	community will
9.1 Conduct short and long-term staff training	Number of staff trained	Training certificates	Availability of funds and qualified staff
9.2 Conduct study tours	Number of study tours conducted	Study tour reports	Availability of funds
9.3 Consult authorities in Mwanza and Mara to acquire an office for the component	Office in place	Site visit	Authorities' will and availability of funds
9.4 Procure office equipment and materials	Number of tools and equipment procured	Annual report	Availability of funds
10.1 Develop component data base	Developed data base	Annual reports	Availability of data base expert
11.1 Vision development workshops	Developed vision in place	National vision report	Availability of funds
11.2 Vision harmonization workshops	Harmonised vision in place	Regional vision report	Availability of funds
Inputs:			
1.1 DSA , field allowances, fuel			
1.2 Polythene tubing, tree seeds, forest soil, manure, diesel, DSA, nursery tools and equipment			
1.3 Casual labourers wages, cost of			

seedlings from commercial nurseries			
1.4 Seedlings distribution cost			
2.1 Survey cost, topographic maps, mapping cost, transport cost			
2.2 - Stationery			
2.3 - Stationery			
2. 4 Field allowances to staff, Sitting allowances to farmers, diesel, Stationery			
2.5 – Diesel, stationery			
3.1 Diesel, field allowances, Stationery			
3.2 Stationery			
3.3 Stationery			
3.4 Sitting allowances to staff and farmers, diesel, Stationery			
3.5 Subsistence allowance Survey team, field allowances local foresters and farmers, stationery, paint,			
3.6 Subsistence allowance cartographers, dural film Ammonia paper, Ammonia solution,			
3.7 Transport, field allowance local foresters and farmers, stationery,			
3.8 Transport, field allowance, stationery			
4.1 Subsistence allowance to inventory team, transport, stationery, field allowance to local foresters and farmers			
4.2 Transport, stationery, field allowance to local foresters and farmers, material costs			
4.3 Subsistence allowance inventory team, wages village data collectors, transport, stationery			
4.4 Stationery, diskettes			
5.1 Subsistence allowances workshop participants, transport, stationery			
5.2 Stationery, printing costs, postage charges, transport			
5.3 Subsistence allowance facilitators, sitting allowance technicians and farmers, transport, stationery			
6.1. Field allowance, transport, stationery			
6.2 Subsistence allowance to facilitator transport, fare, stationery			
6.3 Cost of seeds, transport			
7.1 Subsistance allowances local foresters attending Forestry Department workshops			

8.1 Field allowances to technicians, transport, stationery			
8.2 Transport			
9.1 Tuition fees, travelling costs Subsistence allowances			
9.3 DSA to participants, transport,			
9.4 Renovation cost, stationery, equipment			
10.1 Stationery, diskettes			
11.1 Allowance to workshop participants, travelling costs, stationery			
11.2 DSA to workshop participants, travelling costs			

ANNEX 3: ITINERARY

Date	Activity
24th June 2005	Signing of contract LVEMP Hq, Dsm
25-27th June 2005	Preparation of inception report
28th June 2005	Submission of inception report (5 copies)
28th June - 4th July	Review of documents
5th July 2005	Travel Morogoro - Dsm
6th July 2005	• Fly Dsm – Mwanza • Travel Mwanza - Musoma
7th July 2005	• Agree on workplan with Task Leader and staff • Discussions with component staff
8th July 2005	Field visits: Musoma Rural district pilot villages: Bukabwa, Masurura, Riyamisanga, Kirumi and Bwiregi Primary School
9th July 2005	Field visits: Tarime district pilot villages: Kuruya, Kwibuse and Nyarero and Kuruya Primary School
10th July 2005	Field visits: Bunda district pilot villages: Migungani, Bitaraguru and Kiabakari prison
11th July 2005	Courtesy call on the RAS
	Discussion with other programmes: DDP, WWF, VIFAFI, BRAC
12th July 2005	Discussion with soil and water component staff and consultants
	Wrap up
13th July 2005	Travel Musoma-Mwanza-Dar-Morogoro
14th – 26th July 2005	Preparation of draft report
27th July 2005	Submission of draft report
9th August 2005	Travel Morogoro-Dar
10th August 2005	Travel Dar-Mwanza
11th – 12th August 2005	Attend national workshop - Mwanza
13th August 2005	Travel Mwanza-Dsm-Morogoro
26th August 2005	Submission of final draft national report
28th August 2005	Travel Morogoro-Dar-Kampala
29th-31 August 2005	Attend regional component working session, Mkono
1st September	Travel Kampala-Dar-Morogoro
18th September 2005	Travel Morogoro-Arusha
19th – 20th Sept. 2005	Attend final regional workshop, Arusha
21st September 2005	Travel Arusha-Morogoro

ANNEX 4: PERSONS CONSULTED

Name/Institution/Village	Position at the Time of Meeting
RAS, Musoma	
P.O. Chikira	Regional Administrative Secretary
E. S. Kilosa	Regional Secretariat, Natural Resources
LVEMP- Catchment Afforestation	
Ngatara A. Kimaro	Task Leader, Catchment afforestation
Paul Mutongore	Staff, Catchment afforestation
LVEMP- Soil and Water Conservation	
Emmanuel Mang'ombe	Task Leader, Soil & Water Conservation
Deogratius Peter	Scientist, Soil & Water Conservation
Emma Liwenga	Consultant, Soil & Water Conservation
Richard Kangarawe	Consultant, Soil & Water Conservation
Musoma Municipal Council	
Jonathan A. Mmbaga	District Forest Officer, Musoma Municipal
District Development Programme	
Gedion Shone	Rural Development Advisor
WWF	
William Kasanga	Project Executant
VIFAFI	
Seth Z. Mungure	Agriculture officer
BRAC	
Trophil Kayombo	Livestock Officer
Lazaros Ndosi	Farm Manager
Buhabwa village, Musoma Rural	
Matiku Nyarwangibo	Secretary, Mwarobaini group, Bukabwa
Zacharia Wambura	Chairman, Hichabu group, Bukabwa
Joseph Mugasa	Chairman, Himabu group, Bukabwa
Christopher Oswago	Himabu group, Bukabwa
Mabere Chacha	Mwarobaini group, Bukabwa
Kasogo Muranda	Mwarobaini group, Bukabwa
Rucia Kitego	Mwarobaini group, Bukabwa

Juma Malima	Himabu group, Bukabwa
Zainabu Meli	Hichabu group, Bukabwa
Brandina Juma	Hichabu, group, Bukabwa

Masurura village, Musoma Rural

Juma Mwita	Chairman, Hifadhi Mazingira group, Masurura
Chacha Nyambura	Member, Hifadhi Mazingira group, Masurura
David Rubirya	Chairman, Nguvukazi group, Masurura
Wandere John	Nguvukazi group, Masurura

Riyamisanga village, Musoma Rural

Martin Pepomaiga	Village chairman, Riyamisanga
Alphonce Mancheye	VEO, Riyamisanga
Mwita Chacha	Mazingira group, Riyamisanga
Elizabeth Joseph	Mazingira group, Riyamisanga
Stephen Wandwi	Mazingira group, Riyamisanga
Moris Dominic	Teacher, Bwiregi Primary School, Riyamisanga
Jeremiah Mancheye	Teacher, Bwiregi Primary School, Riyamisanga

Kirumi village, Musoma Rural

Charles Segeru	Chairman, Kirumi village
Wandiba Matambari	Kwirabu CMU group, Kirumi
Raurian Segelu	Secretary, Kwirabu CMU group, Kirumi
Rosea Robert	Kwirabu CMU group, Kirumi

Kiabakari Prison, Musoma Rural

Deodatus Lwanga	Head of prison

Tarime District Council

Jackson Tilya	District Natural Resources Officer

Kwibuse village, Tarime district

Chacha Nyamhaga	Himakwi group, Kwibuse
Wankyo Nyiganda	Himakwi group, Kwibuse
Monica Chacha	Himakwi group, Kwibuse
Mangaraya Mtatiro	Secretary, Himakwi group, Kwibuse
Kikube Mwita	Himakwi group, kwibuse

Kuruya village, Tarime district

Josephat Mirumbi	Village chairman, Kuruya
Dismas Mwita	VEO, Kuruya
Richard Thomas	Chairman, Hemaku goup, Kuruya
Iten'gari Warioba	Deputy secretary, Hemaku group, Kuruya

Focus Mwita	Hemaku group, Kuruya
Leonard Wambura	Village chairman, Kuruya

Kuruya Primary School, Tarime District

Enastazia Mafuru	Head teacher, Kuruya P/S

Nyarero village, Tarime District

Anna John	Chairperson, Tegemeo group, Nyarero
Susan Enock	Tegemeo group, Nyarero
Bina Zakaria	Tegemeo group, Nyarero
Yunis Mwita	Tegemeo group, Nyarero
Nyanokwi Mataro	Tegemeo group, Nyarero
Boke Jeki	Tegemeo group, Nyarero
Nyamwacha Mwita	Tegemeo group, Nyarero

Bitaraguru village, Bunda District

Marwa Mranda	Secretary, Kisami group, Bitaraguru
Machela Maisa	Kisami group, Bitaraguru
Emmanuel Marwa	Kisami group, Bitaraguru
Joseph Patrick	Kisami group, Bitaraguru

Migungani village, Bunda District

Tumaini chacha	Chairman, Jiendeleze group, Migungani
Chausiku Juma	Jiendeleze group, Migungani
Ernest Matiku	Village Council, Migungani
Maro Maswi	Village Council, Migungani

ANNEX 5: LVEMP: CATCHMENT MANAGEMENT ISSUES

1. Catchment afforestation activities	Indicators	Source of Info or Interviews	Other Data
• What are the catchment afforestation activities and to what extent have they contributed to the project objective?	• Activities on the ground, coverage, quality	• Communities • Project staff	• Reports • Field visits
2. Interventions tested and approaches used			
• What interventions were tested ? • What approaches were used?	• Types of interventions and approaches used • Their merits and demerits and effectiveness	• Communities • Project staff	• Reports • Field visits
3. Issues that would have been addressed but were not			
• What issues were not addressed and why? • To what extent have they affected fulfilment of project objectives?		• Project staff	• Reports • Field visits
4. Contribution of catchment afforestation to community and the environment			
• Do communities consider the catchment afforestation beneficial to their livelihoods and environment?	• Evidence of reduced environmental degradation • Water quality and quantity changes over time • Vegetation changes over time	• Communities • Project staff • Partners	• Reports • Field visits
5. Intra and inter-component collaboration			
• To what extent has there been intra and inter-component collaboration?	• Number of activities done collaboratively	• Project staff	• Reports
	• Records of collaborative meetings		
6. Community behavioural change towards tree planting and natural forest conservation			
Are communities considering tree planting and natural forest conservation activities important for their livelihoods and service provision?	• Project activities a priority and accepted/ Adopted by farmers • Rate of adoption and spill-over effects	• Communities	• Reports • Field visits

7**. Other partners/programs complementary to the component activities**			
What other partner/programs are complementary to the sub-component activities?	• Nature of activities undertaken by partners/programs • Number and extent of collaborative activities	• Communities • Project staff • Partners	• Reports • Field visits
8. Problems/constraints encountered in the implementation of the component activities			
• What constraints or impediments limited progress towards achieving the overall purpose of the project?		• Project staff • Communities • Partners	• Reports • Field visits
9. Positive/negative lessons and their underlying factors an			
• What do you consider as positive/negative lessons and their underlying factors?		• Project staff • Communities • Partners	• Reports • Field visits
10. Replication of positive approaches to other areas within or outside the lake basin			
Which areas within and outside the lake basin can the positive approaches be replicated?		• Project staff • Communities • Partners	• Reports • Field visits
11. Methods to be avoided and new methods to be tested in future for sustainability of the program			
• Do you have any proposals of methods to be avoided and new ones to be tested for program sustainability?	• Nature of approaches from environmental, social and economic perspectives	• Communities • Project staff • Partners	• Reports • Field visits