Mara River Basin

Integrated Natural Resource Management

Emerging Good Practices Guide

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ACRONYMS AND ABBREVIATION

LVBC	Lake Victoria Basin Commission
EAC	East African Community
MRB	Mara River Basin
USAID	United State Aid for International Development
WWF	World Wide Fund
INRM	Integrated Natural Resources Management
WRUAs	Water Resource Users Association
WUAs	Water Users Association
NEMA	Natural Environmental Management Authority
MIS	Management Information System
PFM	Participatory Forest Management
KFS	Kenya Forest Services
CBOs	Community Based Organizations
NGO	Non Governmental Organizations
EIA	Environmental Impact Assessment
TOTs	Trainings of Trainers
CFAs	Community Forest Associations
KWS	Kenya Wildlife Service
TWRUF	Trans-boundary Water Resource Users Forum
SOM	soil organic matter
LGRP	Local Government Reform Policy
RBM	Ranger Based Management system
SLM	Sustainable Land Management
CBFM	Community Based Forest Management
SMME	Serengeti Maasai Mara Ecosystem
VLFR	Village Land Forest Reserves
CFR	Community Forest Reserves
PFR	Private Forest Reserves
CFAs	Community Forest Associations
PFRA	Participatory Forest Resources Assessment
CDF	Community Development Fund
USD	United State Dollar
IGAs	Income Generating Activities
ESD	Education for Sustainable Development

TAC	Technical Advisory Committees
ESARPO	Eastern and Southern Africa Regional Programme Office
DFT	District Facilitation Teams
RESAPP	Sustainable Agricultural Productivity Programme
WSMP	Watershed Management Project

ACKNOWLEDGEMENT

EXECUTIVE SUMMARY

Background

LVBC has been implementing Mara River Basin Transboundary Water for Biodiversity and Human Health (in the Mara River Basin Project (TWBHH-MRB) in Mara river Basin since 2009. The project focus include: To promote trans-boundary management framework for Mara River Basin; To improve protection and management of Mau forest resources and Mara riverine forests; To promote improved management of protected areas of Maasai Mara and Serengeti ecosystems; To improve water resources management in the basin; and to improve institutional capacity building of the Lake Victoria Basin Commission to undertake its regional mandate.

In this project Integrated Natural Resource Management (INRM) has been key in its strategic interventions. The promotion of INRM is a critical aspect to enhance ecosystem resilience, provide benefits to the communities, enhance community participation, multi-stakeholder linkages and sustainability of such initiatives. Best practices have emerged out of these experiences both in Mara and many areas of the world. However, some of this information is not documented and thus not available to a wider range of stakeholders within Mara River Basin.

Purpose, Defining INRM and Good Practice

The overall objective of the consultancy was to document and compile a guide for the best practices in INRM including their challenges, and propose suitable channels for disseminating such practices. This documentation is a direct response to the need to provide some of the emerging INRM good practices within the MRB. This report includes also some best practices from outside Mara but with relevance to MRB context, to fill in the gap in knowledge availability.

INRM practice is holistic way of managing resources, taking into account all components and how they interact and impact each other during resources exploitation in order to promote sustainability.

A "Best Practice" is a technique or methodology that, through experience and research, has proven reliably to lead to a desired result. They are ideas, practices or methods new to the community or and organization & which are practical, feasible and replicable and which can be institutionalized.

Identifying "Best Practices" involves judgements that require prior analysis using the following set of criteria: effectiveness, efficiency, relevance, ethical soundness, sustainability, possibility of duplication, partnership, community involvement, and practical commitment.

Emerging good practice on the other hand are those that meet some of the criteria set and are likely to deliver the desired outcomes. These also include lessons learnt from implementing activities that can be used to improve the practice as well as those replicated elsewhere with a similar context.

Methodology

RAI employed a multi-faceted approach in delivery of this assignment. This involved identification and assembling of relevant documents; review of the documents using review checklist developed in line with the emphasis on the INRM focus areas itemized in the TOR, holding stakeholders workshop and sharing the emerging good practices from their workstations (INRM stakeholders training and best practice sharing workshop for local authorities from MRB region from Kenya and Tanzania held in Kisii Kenya (August 2011). The consultants carried out field work in both Kenya and Tanzania (Kisumu, Kericho, Narok, Tans Mara, Mugumu, Bunda, Musoma, Grumeti, Serengeti National park, and Maasai Mara National Reserve and the Mara Triangle of Trans Mara. In these stations they held one-on-one interviews, focus group discussions with local communities, being gender aware in constituting the FGD teams. The Consultants went to key sites of key environmental significance in the Mara River basin in line with the INRM documentation exercise.

Among the key documents assembled and reviewed include: LVBC studies in Mara and key planning documents developed: SEA, NCBA, Environmental Water Flows, EA Protocols of managing natural resources and transboundary and WWF key documents from their work in MRB. The outcome was subjected to a regional stakeholders validation workshop in October 2012 which contributed insights and affirmed these practices and their relevance for tackling MRB natural resources challenges.

Good Practices

This documentation presents some of the emerging INRM good practices, lessons learnt, success stories case studies and documentation of selected practices with implementation challenges and the recomm- ended channels for disseminating them. The emerging good practices are clustered in the following order: conserving water catchments, riverbank management, wildlife management, soil and water conservation, participatory forest management and community participation in INRM.

Cluster of the Good Practice	Good Practice
Conserving water catchments	1. Formation of WRUAs (Kenya) and WUAs(Tanzania) 2. Capacity building of WRUAs officials (hands-on catchment protections techniques/methods) 3. Spring protection(works include fencing off the springs, putting in concrete steps, a discharge pipe or tap, and creating completely separate access points for livestock and human water consumption) 4. Sustainable charcoal burning 5. Lobbying for protection of the Mau Forest Complex
Riverbank management	1. WRUAs and WUAs activities: River bank assessment, Sensitization barazas on the need of river bank; -River-bank tree planting; Promoting high value agro-forestry in the riparian zone (e.g. fruit and fodder trees**).** 2. Livelihood and Conservation Approach in river bank management 3. Stabilisation of the river bank and prevention of erosion
Wildlife management	1. Ranger Based Monitoring (RBM)- Mist Kenya Wildlife Service 2. IKONA Wildlife Management Area Mugumu/Serengeti District council 3. Community Game Scouts

Soil and Water Conservation	1. Demonstration farms 2. Rainwater harvesting / water storage 3. Tree planting/commercial tree nursery (-Increase vegetation cover in degraded / riparian areas) 4. Income generation from high value crops 5. Agroforestry practices
Participatory Forest Management	1. Formation and registration of CFAs as per legislation in Kenya &Tanzania 2. Capacity building and institutional strengthening of CFAs 3. Development of PFM plans 4. Management interventions for forest extension services- Promote on- farm tree planting; Promotion of efficient forest resource utilization technologies; Integrate forest extension with rural development strategies
Community Participation in INRM	1. Community managed conservancy in Trans Mara County Council 2. Partnerships with private sector in provision of capital for CBOs engaged in NBEs e.g. Equity bank 3. Capacity building to of Mara River Water Users Association (in Mulot). Mara River WUA's now transacts business on behalf of WARMA. 4. Capacity building community based organizations to manage natural resources using octagon tools
Energy Conservation	1. Renewable Energy options -Solar Power -Biogas 2. Energy saving devices -Improved cooking stoves(rocket stoves, uhai jiko, -Fireless cookers -Improved charcoal Kilns -Mud stoves especially for the poor households -Energy saving technologies e.g. covering food whilst cooking, Chopping foods to smaller pieces, soaking hard foods prior to cooking.
Equitable benefit sharing	1. E ticketing for accountable revenue collection

Key Lessons learnt itemized in this documentation include: in water and land management in Integrated water Management; integrated decision making and transboundary cooperation for IWRM; key lessons for Monitoring IWRM;

Case studies documented from MRB that highlights/captures some of the lessons learnt in the emerging good practices include: Environmental education, Environmental days, Collective marketing (Mwangaza women group); Success Story Community Forest Scouts services as practical community day to day Forest management mechanism**;** Conserve soils and water sources using Michai chai *(asteria spp)* grasses.

Channels for Dissemination

- Organized groups of farmers.
- Farmers' networks.
- Farmers field school on different practices e.g.
- Agro forestry training centre.
- Agriculture show organized every year in collaboration with Regional commissioner office (government).
- Collaboration with other partners.
- Collaboration with other stakeholders to sensitize by using National big events on tree planting campaign e.g. environmental day, tree planting.
- Involvement of local leaders.
- Websites, social media (facebook, twitter,)

Implementation within MRB

Politics and vested interests: Some land and water management problems are highly contested and complex, with root causes closely linked to powerful interests in both countries. This makes their handling highly sensitive and difficult to address in a direct way through a field based programme. Examples include the Mau forest where project staff received threats for intervening, some hoteliers operating in the Mara River Game Reserve in Kenya and mining operations in Tanzania.

It is important to pilot test all interventions before they are replicated and incorporated as good practice. This requires effective use of 'before and after' field tests, and comparison surveys, in order to clearly show impacts
-Early adapters have benefited.
-Mitigation and adaptation of climate change can be possible through SLM practices

For successful uptake of best practice it is important to draw on and invest in specialist capacity to embed meaningful M&E frameworks at the outset of projects and programmes. This will ensure enhanced capacity of all project staff and development of templates for capturing emerging good practices as part of day to day activities of the project and program implementers

Given the importance of adaptive learning for sustainable natural resource management it is worth investing early in expert advice and training for key staff and stakeholders to enable them to effectively design and manage monitoring and evaluation systems.

Conclusion

This guide has provided tools for documentation, shared some lessons learnt and case studies with success stories on INRM and finally in-depth documentation of good practices within and outside MRB which are applicable to MRB. Documentation of best practices is not worth the paper they are written on unless they are methodically analyzed, contextualized and applied to respond to Environmental challenges of the place under study. Therefore, MRB stakeholders will have to identify which of these apply to their programmes and embed theses alongside the existing programs as well as in design of new programs that seeks to ensure sustainable management of natural resource in MRB.

INRM Forward

This documentation has provided good practice capturing tools. To continuously improve and add on new practices, stakeholders have been asked to use the guidance/tool to regularly map and document the emerging good practices in their day to day work. These will be reviewed at regular best practices forum and updated in LVBC web database for Mara and shared widely.

The uptake of the emerging good practices in INRM should be seen within the broader context of managing change. This requires understanding both the technical and human aspects of the better practices as well as the context under the good practices will apply.

LVBC will play pivotal role in generating, documenting and replicating emerging good practice in integrated Natural resource management in the MRB. Specifically, LVBC role in implementation will be: continue with documentation (b) Equipping partners with tools/guide for documentation c) Regular meetings for sharing and validating emerging good practices d) Reporting of experiences with better practices being replicated in its MRB Web based database.

1.0 INTRODUCTION

1.1. OVERVIEW

The Lake Victoria Basin Commission (LVBC) is a specialized institution of the East African Community (EAC) that is responsible for coordinating the sustainable development agenda of the Lake Victoria Basin. Towards implementation of its Mandate LVBC is coordinating implementation of Projects and Programs in the basin within the partner States namely Burundi, Kenya, Rwanda, Tanzania, and Uganda.

Lake Victoria, which is the second largest freshwater lake in the world, is a major shared resource of the five EAC Partner States. The lake and its basin are globally significant because they support a wide diversity of flora and fauna including a large number of endemic fish species. The lake has a surface area of 68,000 km2, which is shared by three countries, namely, Kenya (6%), Uganda (43%) and Tanzania (51%). The catchment area of the lake is 193,000 km2, which extends into Republics of Rwanda and Burundi. It is estimated that about 35 million people live within the basin.

1.2 BACKGROUND OF MARA RIVER BASIN

Geographic and Economic setting of Mara River Basin

The Mara River Basin (MRB) is one of the drainage basins that feed into Lake Victoria and is functionally and ecologically related to the socioeconomic activities of the lake. The Mara River originates from the Napuiyapui swamp in the Mau Escarpment (2,932 m asl) and flows through the Mau range, the plains of Maasai Mara National Game Reserve in Kenya and Serengeti National Park in Tanzania before entering Lake Victoria (1,134 m asl) (Fig. 1.1). The Mara River Basin (MRB) covers approximately 13,750 km$_2$ and is shared between Kenya (65%) and Tanzania (35%). Kenya holds a key responsibility in determining the future of this basin, as the basin's headwaters stem from Kenya's Mau Escarpment and Loita Hills. The basin is located between longitudes 33º 47' E and 35º 47' E and latitudes 0º 28' S and 1º 52' S
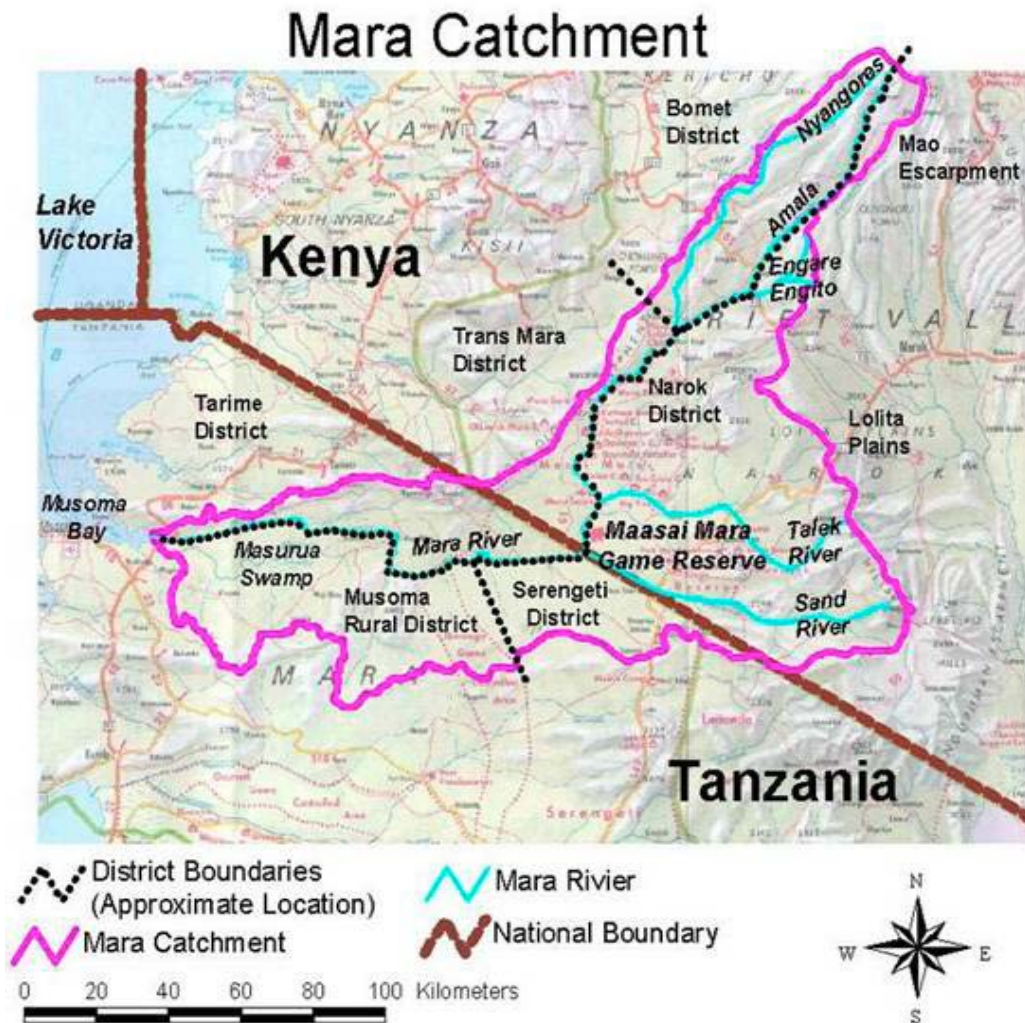
The population in the MRB is approximately 900,000 people, the majority of whom live in Kenya. In Kenya, the combined annual population growth rate for Nakuru, Bomet, Narok and Trans Mara Districts is 2.4% for the period from 1999-2010 (Kenya NBS, 2006). The population growth within the Mara Region of Tanzania, which includes Tarime, Serengeti and Musoma Districts, is 2.5% (Tanzania NBS, 2003). It is projected that the population of Mara will be 1,066,699 in 2020 and 1,356,705 in 2030.

Figure 1: Mara River Basin Catchment

Source (LVBC/WWF-ESARPO, 2010. Biodiversity Strategy and Action Plan for Sustainable Management of the Mara River Basin)

Mara River Basin Fact File

Table 1: Source: Documentation of WWF's Mara River Basin Management Initiative LVBC, USAID and WWF ESARPO 2011 and 2010b

Basic Size	Approx. 13,750 km2 : 65% Kenya, 35% Tanzania
Rainfall	1400 mm/yr in Mau escarpment to 500-700mm/yr in dry plains of NW Tanzania
Elevation Range	3000m asl to 1300m asl
River Length	Approx. 395km
Source	Mau Forest Complex, Kenya
Outlet	Lake Victoria near Musoma, Tanzania
Main Tributaries	Nyangores River, Amala River, Sand River, Talek River, Borogonja River, Tobora, Somonche, (which contribute more than Borogonja) and Tigithe.
Larger Basin	Lake Victoria Basin which feeds the Nile Basin

Four zones from Mau headwaters to lake Victoria

Zone	Dominant Land Uses
Forested upper catchments (up to 3100m altitude)	Mau forest complex (Mau forest is referred to as a Kenya's water tower - it stores rain during the wet seasons and pumps it out during the dry months) Small scale subsistence agriculture (tea / maize / livestock)
Middle rangelands	Small scale agriculture Livestock grazing Settlements – Mulot, Bomet
Savannah plains	Large scale irrigated farming (wheat, maize) Maasai ranches / conservancies – large herds of cattle, sheep and goats using free range grazing Protected Areas for Wildlife (Maasai Mara / Serengeti) with tourist facilities (it is estimated that the Masai Mara has more than 140 facilities with a total bed capacity of over 4000.)
Lower Basin	Gold Mining – 2 large open pit gold mines and small scale artisanal mining Small scale agriculture and livestock grazing The Mara Swamp wetland system providing an important filtration and water purification system The river contributes about 5% of the total inflow to Lake Victoria Settlements – Mugumu

Socio-economic conditions in the Mara River Basin

Population	Estimated at 863,000 (2010 figures), with an estimated growth rate of between 2.3% - 2.9% a year
Poverty	Poverty, hunger and malnutrition affect between 60 and 80% of the population
Water use	60% of all residents obtain their water from the Mara River and its tributaries, much of which is untreated
Economy	Agriculture is the dominant economic activity for more than 80% of the

rural population in the Basin.

The Major Economic Activities include: Large scale farmers with irrigated agriculture (Kenya); Small scale farmers (Kenya and Tanzania); Tourism (Kenya and Tanzania); Pastoralists (Kenya and Tanzania); Mining (small/large scale) (Tanzania); Fishing (Tanzania)

At INRM workshop for local authorities from MRB held in Kisii in August 2011, the stakeholders reaffirmed the following major threats to the basin: Degradation of rangelands by overgrazing ; Source of water used by rural families for drinking is also used by livestock; Deforestation; Charcoal making; Unsustainable utilization of wetlands; Water Collection –Still a burden to Women and Children; Water Pollution (Due to the increase of socio- economic activities such as mining and agricultural activities).

2.0 BACKGROUND TO BEST PRACTICES IN INTERGRATED NATURAL RESOURCES MANAGEMENT IN MARA RIVER BASIN

2.1 CONSULTANCY RATIONALE AND OBJECTIVES

Over the years, several universities and research institutions, public and private institutions have undertaken programmes, projects, studies and other initiatives to promote sustainable and Integrated Natural Resources Management (INRM) in the Mara River Basin (MRB). The promotion of INRM is a critical aspect to enhance ecosystem resilience as well as providing benefits to the communities. It also enhances community participation, multi-stakeholder linkages and sustainability of such initiatives. Best practices have emerged out of these experiences both in Mara and many areas of the world. However, some of this information is not documented and thus not available to a wider range of stakeholders.

It is critical to document and share such good practices among various stakeholders in and out Mara River Basin, including communities. This will enhance adoption of better management techniques for INRM. The challenges met in implementing such practices will also go a long way in helping stakeholders modify and adopt their strategies and minimize duplication of efforts.

2.2 OVERALL OBJECTIVE

The Overall objective of the consultancy is to document and compile a guide for the best practices in INRM including their challenges, and propose suitable channels for disseminating such practices.

2.3 SPECIFIC OBJECTIVES

The specific objectives of the consultancy were:
   I.   To review existing documents and indentify the emerging good practices on INRM applicable to MRB
  II.   To document the identified good practices including challenges for their implementation; and
 III.   To compile the identified good practices into a guide book for wider sharing with the MRB stakeholders.

3.0 DEFINITIONS, METHODOLOGY AND APPROACH

Box 1: INMR Principles

- Gender Mainstreaming
- Socio-Economic Good
- Environmental Laws, Policies
- Culture And Heritage
- WHAT resource (s) is available and in what state are they? e.g. water, wildlife, forest, soils, minerals, air etc . Resources - are of FINITE amounts and distributed in limited TIME and SPACE
- These resources are to be used by WHOM?
- WHEN   this it to be used?
- WHY? Why use the resource?

Therefore Integrated Natural Resources Management (INRM practice) –is holistic way of managing resources, looking at all components and how they interact and impact each other during resources exploitation in order to promote sustainability.

3.1 WORKING DEFINITIONS

Natural Resource - Any resource that has been generated and maintained by natural processes

INRM can be defined as the responsible and broad-based management of the land, water, forest and biological resources base--including genes--needed to sustain agricultural productivity and avert degradation of potential productivity (source: LVBC INRM workshop report).

Box 2: Desired Outcome of INRM

- Improved ecosystem health (indicator- good water quality and quantity, reduced conflict for resources, continued wildlife migrations etc).
- Improved socio-economic wellbeing in a manner that is environmentally sustainable.
- Improved gender parity in resource access, use and benefits.
- Enhanced Natural Resource governance and accountability
- Economic development which answers to environmental threats

OOD / BEST PRACTICE CONCEPT

A "Best Practice" is commonly defined as "a technique or methodology that, through experience and research, has proven reliably to lead to a desired result.

Results can be partial and may be related to only one or more components of the practice being considered. Indeed, documenting and applying lessons learned on what does not work and why it does not work is an integral part of "Best Practice" so that the same types of mistakes can be avoided by other programmes and projects.

(2) It is "knowledge about what works in specific situations and contexts, without using inordinate resources to achieve the desired results, and which can be used to develop and implement solutions adapted to similar problems in other situations and contexts".

(3) They are ideas, practices or methods new to the community or organization and which are practical, feasible and replicable and which can be institutionalized.

Documenting and sharing "Best Practices" affords one the opportunity to acquire knowledge about lessons learned and continue learning about how to improve and adapt strategies and activities through feedback, reflection and analysis in order to implement larger-scale, sustained, and more effective interventions.

CRITERIA FOR IDENTIFYING BEST PRACTICE

Identifying "Best Practices" involves judgment that require prior analysis using the following set of criteria: **effectiveness, efficiency, relevance, ethical soundness, sustainability, possibility of duplication, partnership, community involvement, and practical commitment.**

Effectiveness: This is a fundamental criterion implicit in the definition. The practice must work and achieve results that are measurable.
Efficiency: The proposed practice must produce results with a reasonable level of resources and time.
Relevance: The proposed practice must address the priority problems in the Project Region.
Ethical soundness: The practice must respect the current rules of ethics for dealing with human and animal populations.
Sustainability: The proposed practice must be implementable over a long period of time without any massive injection of additional resources.
Possibility of duplication .The proposed practice, as carried out, must be replicable elsewhere in the Region.
Involvement of partnerships: The proposed practice must involve satisfactory collaboration between several stakeholders.
Community involvement: The proposed practice must involve participation of the affected communities.
Political commitment: The proposed practice must have support from the relevant national or local authorities.

By definition, a "Best Practice" should meet at least the "**effectiveness**", "**efficiency**" and "relevance" criteria in addition to one or more of the other criteria

Emerging good practice on the other hand are those that meet some the criteria set and are promising to deliver the desired outcomes. These may not have been formally validated and approved a given body as best practices but have proven to give the desired results even partially. These also include lessons learnt

from implementing activities that can be used to improve the practice as well as replicated elsewhere with similar context. In this documentation we shall use this term emerging good practice.

Capacity is the ability of individuals, institutions and societies to perform functions, solve problems, and set and achieve objectives in a sustainable manner. Capacity building is the process through which the abilities to do so are obtained, strengthened, adapted and maintained over time.' UNDP 2006

3.2 METHODOLOGY

RAI employed a multi-faceted approach in delivery of this assignment. This involved identification and assembling of relevant documents; review of the documents using review checklist developed in line with the emphasis on the INRM focus areas itemized in the TOR, holding stakeholders workshop and sharing the emerging good practices from their workstations (INRM stakeholders training and best practice sharing workshop for local authorities from MRB region from Kenya and Tanzania held in Kisii Kenya (August 2011).

The consultants carried out field work in both Kenya and Tanzania: Kisumu, Kericho, Narok, Trans Mara, Mugumu, Bunda, Musoma, Grumeti, Serengeti National Park, and Masai Mara National Reserve and the Mara Triangle of TransMara. In these stations they held one- on- one interviews, focus group discussions (FGDs) with local communities being gender aware in constituting the FGD teams. The Consultants went to key sites of key environmental significance in the Mara River basin in line with the INRM documentation exercise.

Among the key documents assembled and reviewed include: LVBC studies in Mara and key planning documents developed: SEA, NCBA, water Flows, EA Protocols of managing Natural resources and transboundary, WWF key documents from their work in Mara (emerging insights for sustainable river basin management from the transboundary Mara of Kenya and Tanzania).

The best practices from these documents and visits were mapped and key ones itemized for further review, on field validation and detailed documentations. Others have been discussed as lessons learnt and success stories case studies which can inspire and give deeper information of its application.

After identification the consultants embarked on documentation of these as a guide that will be used by MRB stakeholders. The output was then presented at a validation workshop where the INRM stakeholders enriched the draft and with their inputs/comments being incorporated to finalize the guide. The final guide was externally reviewed and then finalized in readiness for publication and wider dissemination.

4.0 GOOD PRACTICES IN INRM

This section presents some of the emerging good practices in INRM, lessons learnt, success stories case studies and documentation of selected practices with implementation challenges and the recommended channels for disseminating them. The emerging good practices are clustered in the following order: conserving water catchments, riverbank management, wildlife management, soil and water conservation, participatory forest management and community participation in INRM.

4.1 SUMMARY OF EMERGING GOOD PRACTICES INRM APPLICABLE TO MRB

Table 2: SUMMARY OF EMERGING GOOD PRACTICES IN INRM APPLICABLE TO MRB

Category	Emerging Good Practices &Location	Qualifications/indicators(/evidence	Implementation Challenges in Mara River Basin	Suitable channels for Emerging Good Practice Dissemination
1.Conserving water Catchments	1. Formation of WRUAs (Kenya) and WUAs (Tanzania) -Capacity building of WRUA/WUAs officials (hands-on catchment protections techniques/methods)	-Community involvement as a key stakeholder in INRM (management empowerment, benefits sharing from NR). -WRUAs/WUAs sub catchment plans	-Political interference -Resource for day to day activities before getting income from their NBEs - Cultural change difficulties	-Exchange visits to functional WRUAs -Village /Community meetings -Sharing case studies of functional WRUAs/WUAs in NRM forum/networks -Uploading in websites/MIS databases
	2. Spring Protection -Works include fencing off the springs, putting in concrete steps, a discharge pipe or tap, and creating separate access points for livestock and human water consump-tion. -trees are planted around the spring for beautification and to stabilise the soil	-Reduce surface water pollution of water sources (for drinking water) and help to secure a more reliable supply of water for communities -An evaluation of 2 springs in Tanzania showed a 90% reduction in total coliform bacteria in the water after spring protection (WWF study, 2012)	-Community health awareness on need to boil water or treating consumption before use -High cost of putting in concrete structures -Limited application re: demarcation and fencing of spring sites as opposed to the entire spring catchment.	- Cross site visits to other communities - Use of media i.e Films, Documentaries - Demonstration plots
2. Riverbank management	1. WRUAs and WUAs activities: •River bank assessment	-The riverbanks at the 3 sites have been protected and the vegetation cover	• Communities consider their land to extend up to the river and so the concept	-Exchange visits to functional WRUAs -Village /Community meetings (Barazas)

	done by MOA, WARMA and NEMA involving WRUAs • Sensitization barazas on the need of river bank management •Riverbank tree planting •Promoting high value agro-forestry in the riparian zone (e.g. fruit and fodder trees**)**	increased. -community participation in riverbank protection increased -Removing eucalyptus along river banks -Reduces river bank erosion whilst maintaining an income for the farmer	of riverine/Government land for protection is new and they consider it as taking away their land and forcing them to protect it. (Requires proper sensitization, time to sink and them eventually seeing benefits from protecting the river banks). •The newly formed WRUAs lack resources to continue with the riverbank protection work without facilitation. -More secure tenure arrangements, incentives or subsidies could help improve uptake and replication -Interventions should be *risk-based,* targeted at areas which are having the greatest impact on the river. Thus requires careful analysis of the catchment prior to starting projects	-Sharing case studies of WRUAs/WUAs successful riverbank initiatives in NRM forum/networks -Uploading in websites/MIS databases -Publish the good practices in print media - Workshops/seminars - Electronic media e.g. audio/visual, webpage, email, Web forums, facebook/twitter
3. Wildlife management	1.Ranger Base Monitoring (RBM)- Mist Kenya Wildlife Service 2.IKONAWildlife Management Area Mugumu/Serengeti District council	-Regularly monitors protected area by law enforcement staff in order to understand the illegal human use of the habitat (poaching etc), ecological processes in the PAs and	-Community/human wildlife conflicts -Cultural modification from incoming western cultures Climate change	• Workshops • Exchange trips • Films/Documentaries • Brochures/Posters

	3. Community Game Scouts 4. Mara Conservancy group &Hotels on benefit sharing(cultural manyattas visits electronically receipted at the hotels) 5. The Mara Game Scouts/ Community scouts WWF	distribution and habitat use of specific key species. -People centred wildlife management -Management of wildlife by decentralization through devolution of powers to local community		• Barazas
4. Soil and water conservation	1.Farming to reduce sedimentation-terracing, removing eucalyptus along river banks (Farm forestry & Afforestation Agroforestry (Vi-Musoma Foundation Help WWF, WUAS) •increased awareness on the need for soil conservation •adoption of soil conservation techniques by farmers •better land use practices	KFS Narok, Mau forest •Vast areas needed soil conservation initiatives •The terrain is so hardy and intervention is almost impossible especially in Kipsugur area •Techniques for soil conservation were lacking •Farmers considered their land to be theirs and that they could use them at their own discretion	-Major water users such as mining companies and tourism operations who pose and face greater individual water risks and have greater individual influence -Multidisciplinary team which is able to influence land and water management practices at multiple levels and to engage / influence private sector as well as community groups. -Skills required include community development and livelihood support, land management, policy engagement and private sector liaison	•Assessment was done and the PIC prioritized working at 3 sites •Farmers were trained •Sensitization barazas were held •Tools and equipment were provided •Field days were done and demonstration plots were established •Awareness through posters •Planting of fodder and food crops on terraces to encourage farmers do terraces -WUAs and government extension officers with adequate incentives and resources

5.Participatory Forest Management	1. Participatory Forest Managament Case studies. Functional CFAs Case studies e.g. South Nandi Forest CFA,	-Formation and registration of CFAs as per legislation in Kenya & Tanzania -Development of PFM plans (Nyangores, Olenguone,Nairot) -Benefit sharing agreements with Gov agencies (KFS) -Training in PFM and change of attitude to Forest resources and new management system(co-management)	Political interference Lagging of institutions to act e.g. signing of MFP has delayed implementations in some areas	Exchange visits PFM Training CFAs/Forest Staff Regular meetings by established institutions e.g. CFAs, Scouts
6. community participation in INRM	1.Community managed conservancy in Trans Mara County Council 2. WARMA Contracting Community Group-Mara WRUAs 3.Partneships with private sector in provision of capital for CBOs engaged in NBEs e.g. Equity bank 3. Capacity building of Mara River Water Users Association/in Mulot WUA's now transacts business on behalf of WARMA.	Mara River Water Users Association	-Multidisciplinary team(able to influence land and water management practices at multiple levels and to engage / influence private sector as well as community groups)**.** **-**Required skills(community development and livelihood support, land management, policy engagement and private sector liaison) -Applicable values (Transparency and accountability among leaders).	Village meetings/Barazas Regular officials Forum with NGO/Government staff Regular reporting of activities' progress Trainings on various matters e.g. Bookkeeping, Monitoring
Energy Conservation	a. Renewable Energy options	-Reduce woodfuel	-Unreliable amounts of sunlight in some areas	-EIA reports and distribution of it to various stakeholders

RETOUCH
AFRICA
INTERNATIONAL
LIMITED

	- Solar Power - Biogas b. Energy saving devices -Improved cooking stoves(rocket stoves, uhai jiko, -Fireless cookers - Improved charcoal Kilns Mud stoves especially for the poor households -Energy saving technologies e.g. covering food whilst cooking, Chopping foods to smaller pieces, soaking hard foods prior to cooking. Location: Musoma, South Nandi and Kakamega.	consumption Energy savings of over 45% fuel consumption efficiency -Reduces indoor pollution thus better health & shorter cooking time -Reduces wastage thus sufficient burning and use of fuel	-Insufficient dung for the Biogas Digestor -Lack of woodlots for firewood -Over dependence on forest wood fuel -Cultural acceptance as some communities do not want to use biogas energy from human waste. -Lack of trained technical staffing remote rural areas -Limit of project areas where work is being implemented especially specified by NGOs	-Exchange trips to other areas is crucial so as to learn from others experiences Onsite trainings within CBOs -Household demonstrations on installation and fabrication Institutional biomass use reports and interviews -Exchange trips to other communities and learn on variety of other fuel efficient meals that can be made Continuously build capacities of TOTs Media i.e. Films, Poster/Brochures
7.Equitable benefit sharing of Natural resources	-E-ticketing compare with what Masai Mara & Trans Mara system -System that ensure incomes reach household levels -Location: MERCEP Mt Elgon -Payment of ecosystem services WRUAs &CFAs in Kenya	KWS & TANAPA KFS	Land use systems Human wildlife conflicts Lack of support from government institutions Climate change Unclear policies on benefit sharing Institutions have no legal - frameworks or guidelines on the benefit sharing -Lack of compensation schemes by government and time taken to implement the same	Trainings/Workshops Exchange trips Training TOTs Putting up CFAs and WRUS as institutions which are independent Media i.e. Brochures, Relevant Acts

Box 3: Key Lessons Learned for Land and Water Management for INRM

A. Key Lessons Learned for Land And Water Management for INRM

1. **Small-scale, community-based interventions such as riparian zone planting and protection can be successfully promoted and adopted and may contribute to improved catchment health**. However, to ensure an observable and long term benefit to the river system requires: a) monitoring to characterise the impacts of the intervention; and b) interventions found to be effective to be implemented at scale.

2. **For efficient allocation of resources, interventions should be *risk-based,* targeted at areas which are having the greatest impact on the river.** This requires careful analysis of the catchment prior to starting projects on the ground, and subsequent targeting and monitoring of interventions in order to make evidence-based decisions.

3. **The success of land and water management interventions piloted under the Initiative was highly variable.** A vast range of endogenous and exogenous factors affect the success of community based interventions, including altitude, location, socio-economic factors, access to markets, as well as the level of resource invested and the level of support provided. To maximize learning and to support an adaptive management response these interventions require follow up support and monitoring. This was not always prioritized within the Initiative, partly because follow up support was provided through government extension workers with numerous other responsibilities.

4. **Spring protection can reduce surface water pollution of water sources used for drinking water and help to secure a more reliable supply of water**. The potential benefits of spring protection works to the community in terms of health and ease of access to water are valuable, even though the impact on the overall river is likely to be minimal.

5. 5. **River bank protection through promoting high value agro-forestry in the riparian zone (e.g. fruit and fodder trees) has been shown to be an effective way of reducing river bank erosion whilst maintaining an income for the farmer.** The success is in part due to a good market for the timber produced, as well as the production of fruit and fodder. However, peoples' motivations to participate vary. More secure tenure arrangements, incentives or subsidies could help improve uptake and replication.

6. **Replication of effective interventions requires an investment of time and effort to motivate and incentivize people to change their practices.** Catchment Management Groups or Water User Associations (where they exist) and the Government extension officers are well placed to take on this role, particularly if it became a core part of their responsibility and they receive appropriate incentives and resources.

7. **A strategic Initiative operating in a complex catchment such as the Mara Basin needs a multidisciplinary team which is able to influence land and water management practices at multiple levels and to engage / influence private sector as well as community groups.** Skills required include community development and livelihood support, land management, policy engagement and private sector liaison.

8. **Livelihood improvement interventions can deliver short term benefits to people living in the catchment and provide short term incentives for people to engage in other aspects of the Initiative**. However, within the context of an Integrated Water Resource Management Initiative, it is important

that these interventions have clear and proven links with improving water resource management and that these links are well understood by the community. In the Mara Initiative those links were sometimes merely assumed, and this has hindered impact, uptake and lesson learning.

9. **Livelihood improvement interventions such as vegetable growing or tree nurseries are only a sustainable and effective means of generating income if people have access to markets to sell the products**.

10. **It is important to pilot test all interventions before they are replicated and incorporated as good practice**. This requires effective use of 'before and after' field tests, and comparison surveys, in order to clearly show impacts.

Source: WWF Documentation of WWF's Mara River Basin Management Initiative: Summary of key insights and lessons

Box 4: Key Lessons For Integrated Decision-Making and Trans-boundary Cooperation for INRM

B. Key Lessons for Integrated Decision-Making and Trans-boundary Cooperation for INRM

1. **Strategic studies such as Strategic Environmental Assessments and Environmental Flows Assessments are an important way of considering the whole range of factors that affect the functioning of the river basin in a holistic way**. By involving government organizations, NGO staff and water users in these exercises, the SEA and EFA processes in the Mara River Basin helped to increase peoples' understanding of the river basin and the strategic challenges faced by it. With hindsight such studies should have been undertaken at the outset of the MRBMI to inform its priorities.

2. **To guide efficient allocation of programme effort in a complex river basin such as the Mara, interventions and priorities should be based on a strong evidence base.** Of course this may be a challenge where little empirical data is available, but priority setting exercises based on triangulating between expert testimony, stakeholder experiences and on the ground validation and use of a risk based approach are viable even in unstudied catchments.

3**. The presence of a strong and motivated supra-regional body such as the Lake Victoria Basin Commission with the mandate to convene senior government officials, influence government policies and plans, and instigate initiatives is a critical element for successful trans-boundary river basin management.**

4. **The Trans-boundary Water Resource Users Forum (TWRUF) has helped water users to understand each other's interests and problems across national boundaries.** Because the Mara TWRUF is hosted within the LVBC, the voices and concerns of water users can now feed into high level, international discussions about river basin management.

5. **Where more than one donor supported programme is operating in a river basin they should meet regularly to identify areas for joint action, avoid duplication of effort and address conflicting strategies**. The donor forum has been an effective way of convening this discussion, but collaboration also relies on good personal relationships between programme staff. Ideally, an overarching basin plan for the basin would guide all interventions in the basin.

6. **Project teams situated in different parts of the catchment (particularly in different countries) need to make special effort to work together to develop a single coherent work plan, share data and lessons, undertake joint studies, and collaborate in addressing strategic challenges**

Source: WWF Documentation of WWF's Mara River Basin Management Initiative: Summary of key insights and lessons

Box 5: Key lessons for monitoring for INRM

C. Key lessons for monitoring for INRM

1. **INRM initiatives need to invest in a robust monitoring system from the very start of the programme in order to be able to demonstrate the contribution of their interventions to the overall health of the river system and wellbeing of the population living there.** Without a baseline, which determines the situation before an intervention starts, it is not possible to evaluate impact in a rigorous way or learn for the future.

2. **Data collection and decision making should be expedient and draw on multiple sources of knowledge particularly where long term data sets and trend analysis do not exist.** Relevant and useful data is collected and held by a wide variety of government departments, individuals and organizations. For example, local health clinics can provide useful information about the frequency of water borne diseases and local government, village leaders or the police will hold records on water related conflict. Large amounts of relevant information - both qualitative and quantitative - can be gathered and triangulated to guide and assess INRM interventions. If this data is collated, analysed and stored in a shared domain it can help build a reliable picture about the priorities for management.

3. **The effective functioning of water quality and quantity monitoring networks are dependent on having appropriate infrastructure but also on-going calibration checks and maintenance of equipment, training and regular payment for recorders.** Despite the importance of long term monitoring records, their maintenance even at strategically important locations has received low priority in the past.

4. **Simple and effective monitoring strategies are available which can provide valuable information for water resource management, and the efficacy of interventions without large scale investment in equipment or infrastructure.** For example, turbidity tubes and community indicators of flow regime are low cost, mobile and easy to use, and can provide insights about key issues.

5. **Monitoring is more than collecting data**. The process is only valuable if it ultimately informs decision-making and improves how water resources are managed. Analysing and communicating the results of monitoring requires an investment of time and resources.

6. **In the absence of effective monitoring, adaptive management becomes impossible.** Because of the complexity and dynamism of water resource management continual experimentation, feedback and information flow is needed to guide managers in corrective or proactive action and modified interventions.

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7. **The roles, responsibilities and obligations of those involved in need to be very clear and where necessary resourced and formalized**. For example where government, NGOs and communities collaborate on monitoring both locally and in trans-boundary systems, it is vital that quality and consistency is assured and that each party has a clear understanding and mutual support in their roles. Formal contracts, setting out standards of service and financial arrangements which can be reviewed regularly to guide improved performance should be prioritized.
Source: WWF Documentation of WWF's Mara River Basin Management Initiative: Summary of key insights and lessons

1. Similarly, the MRBMI has played an important role as a conveyor to facilitate legal agreements between water users and government, and has successfully mobilized individuals and community leaders who act as 'champions' for better water resource management in the catchment. However, roles and responsibilities must be clearly defined and respected. There are some roles that NGOs cannot or should not perform, such as licensing and law enforcement around pollution and abstraction. These are roles requiring a government mandate which must be delivered by government or formally delegated in a way which is mutually complementary to the efforts of NGOs and communities.

2. **Efforts to improve trans-boundary water resource governance need to be aligned and allied with the efforts of national and supra-national agencies.**
For example, regional economic bodies such as the East African Community have a mandate and the convening power to influence national government decision-making.

3. **Initiatives to support INRM need to develop targeted strategies to hold the most powerful stakeholders and water users to account, and strengthen the voice of the most vulnerable.**
Such strategies should be risk based. That is, they should prioritize engagement with those who have most influence, or whom are influenced most by water resource management, as identified by thorough participatory stakeholder analysis. Resulting activities should similarly be shaped by a participatory situated analysis of the priorities and root cause issues for more sustainable and equitable resource use and management. They may include research, provision of technical advice, demonstration projects, communications, capacity building, practical interventions, lobbying and advocacy campaigns, budget tracking and accountability monitoring tailored according to the issues of priority concern and the needs, motivations and power of stakeholders. The MRBMI learnt that some problems could be more effectively tackled at higher scales, for example through national policy dialogue (as with the Mau Forest), or through the regional institutions (such as the Lake Victoria Basin Commission), while others could be effectively delivered through community self-help groups (such as river bank pegging and spring protection through Catchment Management Groups). Where appropriate ESA's should develop partnerships with other organisations in order to tackle problems at the most appropriate levels.

4. **INRM interventions should be strategic and based on adaptive understanding of the main risks facing sustainable resource use and human wellbeing**
Limited management resources should be targeted at the most significant problems. For example, the MRBMI evaluation of 2010 concluded that water extraction and consumptive use for agriculture will play a greater role in modifying the flow regime of the Mara than deforestation ever could. Yet, the MRBMI has invested relatively greater effort in tree-planting projects and protecting the Mau Forest, compared to engaging with irrigated agriculture or advocating for a sustainable water resource allocation plan. Strategic prioritization techniques and root cause analysis should be carefully employed to identify change objectives, and inform the design of activities.

5. The rationale underpinning interventions to improve land and water management practices must be articulated, fully tested and proven before being they are scaled up.

For example it is important to clearly establish the link between alternative livelihoods such as bee-keeping, dairy goat farming, spring protection and energy saving stoves, and sustainable land and water resource management in the basin. Without a clear understanding of the linkages between management practices and outcomes, potentially unhelpful myths can be easily perpetuated and core objectives can be side-tracked.

6. Stakeholder platforms must add value and their membership and their objectives fit for purpose.

Whilst it is important to ensure balanced representation, interests and gender, board members of stakeholder groups also require a spread of skills to raise and manage funds, understand water resource management issues, and to negotiate with government. As some of the stakeholder platforms in the Mara have developed and evolved, the level of responsibility and skills required of their boards has increased. The Mara WRUA has responded to this challenge by employing a manager, while the TWRUF is reconsidering its membership so it is better able to act at an international, regional level.

7. ESA support programmes for INRM need to consider from the outset the long term role of stakeholder platforms, their relationships with statutory institutions and their sustainability beyond the intervention.

Factors affecting the sustainability of stakeholder platforms in the Mara River Basin are:
- ❖ -securing formal recognition;
- ❖ -the ability to raise funds or influence allocation of resources;
- ❖ -development of strong internal governance systems to develop and adapt plans,
- ❖ -manage financial, and ensure balanced representation to the memberships views.

Factors affecting the sustainability of land and water management interventions are:
- ❖ ensuring community buy in and investment in projects;
- ❖ ensuring communities see benefits, and have the skills to replicate the intervention or carry out maintenance;
- ❖ establishing a sustainable financing systems for replication (such as credit, or merry go round loans);
- ❖ investing in peer-to-peer learning (such as merry-go-rounds, demonstration sites);
- ❖ securing the support and resources of government extension officers to provide follow up support and replication.

Factors affecting the sustainability of programme impacts and achievements:
- ❖ Developing an exit strategy for all interventions from the outset;
- ❖ Planning for the handover or on-going ownership of processes, stakeholder coordination and support, and research and knowledge management systems to mandated institutions;
- ❖ Undertaking baseline studies and regular monitoring and evaluation, to inform corrective and adaptive management, show progress towards objectives and ensure that interventions are targeting key risks to the basin;
- ❖ Working in genuine partnership with all stakeholders including government, communities, private sector, academia, other ESAs and donors.

4.3 CASE STUDIES FROM MRB THAT CAPTURES SOME OF THE LESSONS LEARNT AND SOME EMERGING IGOOD PRACTICES IN NRM

CASE STUDY 1: Environmental Education

Success story on Environmental education and using banana bark as environmental friendly and cost effective potting tubes

"I' m Mwalimu Rose Odhiambo here at Chereche Primary school Rorya, I ' m a teacher who is

responsible for environmental issue at our school .Our school joined Farmers of the future program since 2011 since then we had enjoyed a lot of training on environmental issues including climate change and its impact on human beings. There as our response in combating climate change we started nurseries and tree planting and the facilitation of VI- extension staffs who always were there to support us now we are enjoying as our tree are growing to good pace so we thanks Vi tree very much for their supporter"

Figure 3: Mwalimu Rose supervising the nurseries

Figure 2: Guest of honor Mrs. Neema Kitila of VI Agroforestry plants a tree during Environment Day

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Figure 4: Potting tubes made locally from banana leaves

Figure 5: Technical Staff Mr. Elton Mtani demonstrates on seed planting techniques. (Direct sowing of trees

JUNE 2012
What: Inaugurations of Environment Day
When: June 5th, 2012
Place: Morembe Day Secondary School

Why: Environment conservation and Tree planting
The event was organized by Vi Mara project under FOF programmes.
The event was also attended by Capacity Building Officers from sister projects and Technical Advisor who were also in the Programme meeting at Mara Project. Tanzania

Box 6: Lesson Learnt

- ❖ Through collaboration**, networking, involvement and participation of different key stake holders** such as NGOs, government departments, local leaders and the community themselves in program implementation, networks and linkages are created so that these groups and schools continue collaborating even after program phase out.

- ❖ Through working with schools, Vi reaches present farmers indirectly and future farmers directly.

- ❖ The use of the **peer educator approach** encourages continuity since they are members of the communities and thus will always continue reaching other community members even if the program withdrew from such areas.

- ❖ The **set up of different clubs in schools**. These clubs are responsible for the management of the different interventions in schools.

- ❖ The presences of responsible teachers to manage project interventions in schools enhance the sustainability of those interventions. These teachers are fully responsible for the monitoring of program interventions, ensures proper allocation and management of resources in both the schools.

- ❖ The involvements of **community leader at the beginning of the project** and during project implementation will encourage and enhance sustainability as these will not let the good things that has been established to stop as the questions of vulnerable children is the problem of the community member themselves.

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CASE STUDY 2: Collective Marketing (Mwangaza Women Group)

Figure 6: Mrs John Bingile Chairperson of Mwangaza Women Group

Location Area: Tanzania, Serengeti District, Kunzugu Ward

History and Achievements

"My group found in 2001 with **7 women** and the purpose of **fighting against poverty**. The major activity is that we have is **cultivate vegetable and fruits gardens** along the lake in Serengeti. Now the group has grown and we are **30 women** in our group. Before engaging in this activity it was difficult as a woman to have your income and assist in buying home food. After getting the first sharing we bought cloth, bed, home vessels. As the time goes the ambition and the profit is increasing now with Vi's **assistance we are sending our children to secondary school** and we have **sustainable income**. The major **challenge** that we are facing is problem is **flood and lack of sustainable market** when there is heavy rainfall all our gardens are covered with water from lake, that causes great loss and we are becoming idle, **lack of knowledge about other enterprise like poultry and food processing** so that we can add value in our products

Figure 7: Members of Mwangaza women group

Figure 8:The members harvesting tomatoes

Figure 9:The members in their vegetable farm

Figure 10:Lettuce in one of Mwangaza's farms

Support

The Vi Technical staff have taught us on PMG's advantages and Agroforestry techniques on the farm. He has been helping us on the place to get inputs like seeds and the government in our ward they are at the last stage preparing the market. We have realized the benefits of working as the team and since we have worked with Vi we have acquired the techniques that we didn't get in the class since most of our members are standard seven.

Capacity building

In addition to that Vi has been a great help by giving us technical staff that are teaching us better method of land management. We have attended the Mara Region Agriculture show that organized by government with collaboration with Vi Mara project: whereby we sell our products and meet various entrepreneurs to exchange knowledge with various people. But more effort is needed to capacitate farmers like us with little knowledge about poultry keeping, and food processing. Thanks to Vi now income is not a problem to the women in our group and we've reduced poverty to some extent in our families. Now even without depending to our men/ husband women can have money.

Sustainability

We have seen the fruits of being a working group and independently as women that it can give us sustainable activities, now we are moving forward from buying cloth to building modern house we want to leave huts and poverty by working hard and educate our children, now we are capable to cultivate gardens but we want to establish poultry business and expand our resources.

As a result of the good work of Vi Agroforestry; I and my family have benefited a lot in awareness of Agroforestry practices and an increased environment conservation in the area as well as reduce soil erosion, and increased agricultural production. Currently, I bought a piece of land 20 km from my house and planted sweet potatoes; with the modern agricultural techniques that I have acquired from Vi Agroforestry. I managed to secure a contract of supplying 100 kgs of sweet potatoes to the neighboring entrepreneur; I sell each kilo of sweet potatoes at 100 Rwandan Francs every Tuesday of the week. Out of this income am able to pay tuition fee for my son at the University since the young one are benefiting from Nine Years Basic Education.

CASE STUDY 3: Forest Protection by Forest-adjacent communities through Forest Scouts in South Nandi Forest

Introduction

Human pressure in the form of illegal utilization and harvesting of forest products is the main cause of forest degradation. Forest protection is a major function of KFS, often in the form of joint patrols conducted sometimes with KWS staff. Traditionally, patrolling has been relied upon as the main

protection activity but, despite these efforts, it has not been possible to control the level of unregulated use.

Figure 11:Forest scouts in surveillance mission in Nandi south forest

Experience has shown that adequate levels of forest protection cannot be achieved through confrontation and conflict between the managers and forest-adjacent communities. In practice, both local people and the government have a mutual interest in conserving the forest, and utilizing forest products in a sustainable way. Consequently, this emerging good practice will be to work together with communities to develop joint protection systems in return for agreed levels of utilization and benefit-sharing within the capacity of the forest to meet subsistence needs sustainably.

The project engaged communities through many ways including community scouts to work with forest rangers in community policing of forests. For community Forest Scouts to function, they went through public barazas vetting where only those who met integrity test were selected. They were further trained and equipped by the project to perform their duties. Initially, not very welcomed by the rangers who thought they were encroaching their mandate, (sometime acting as check and balance for some who were colluding with illegal loggers) but later this improved and they seamless started working collaboratively. As a result, illegal activities have decreased by 85% according to KFS Year 5 project Annual report.

Implementation of the Practice

Key Steps
- Public awareness barazas to sensitize communities of PFM
- Selection of Community Volunteers to be Community Forest Scouts and vetting through the public *barazas*
- Training and equipping the Scouts (on PFM training, paramilitary training of forest rangers, mobile phones, uniforms) facilitated by Nature Kenya with funding from DFID and other development partners.

1. Initiate patrols between KFS and local communities
2. Increase the frequency of foot patrols with a vehicle backup
3. Improve patrolling plans and systematic reporting of patrolling findings

4. Secure financial resources to keep roads in good condition and rationalize the road network for easier patrolling and reduced access for poaching
5. Provide resources for improved communication by radio, cell phones and transport to support forest protection
6. Promote a remuneration and rewards system for the most effective scouts
7. Train KWS/KFS staff and scouts on skills needed for effective forest protection

Started Community Revolving Fund for quick wins for local communities engaged in conservation activities (nature based enterprises).

Box 7: Success Story Community Forest Scouts services as practical community day to day Forest management mechanism

Keys Results of the Practice

- Significant reduction in illegal activities out carried in the forest. Only 89 illegal activities reported compared hundreds that used to be reported before**.**
- Greater attachment of the communities and ownership unlike previously where they considered it a government forest with motivation to extract the resources for personal gain at slightest opportunity (engaging in illegal activities was seen as legitimate since the forest belonged to their ancestors but it was forcefully taken away from them).

Success factors

We were elected through public *barazas* by the community, attended basic training on forest protection and reporting illegal activities in the forest. This was a voluntary activity because we realized this is our forest and having been elected by the community we felt a sense to serve them, we have succeeded because we have phones for reporting and motorbikes for doing patrols. Although we were initially scared, we have been supported by also our area chiefs and other leaders through punishing people found with forest evils. There was hatred at first as we were seen as traitors but we overcame this through dedication, volunteerism and perseverance to our work. Now the demands from our families to fend for them at the same time dedicate ourselves to scouting is proving a challenge. We therefore should be motivated to continue providing this important service.

 "My wife expects a husband and a father when I came back from forest scouting mission. Therefore, if I cannot provide for the family, then I must rethink what my priorities are. It is important that we take care of our families as we take care of the forest, but not forests at the expense of our families.… thus to make it workable for us some motivation must be provided by the project/programme".

Community sensitization about their role in forest management through barazas, public vetting, training, equipping and joint patrols with rangers (also acted as checks and balances for some rangers who collude with poachers and illegal loggers)

Sustainability of Forest Scouts Service

Whereas the project supported the scouts with tools of trade, for this service to continue the scouts require motivation, continued skills enhancement and equipping. The **Community Revolving Fund** that was envisaged to cater for such needs is not yet functional. As result, an alternative mechanism should be put in place to allow for continuity of this crucial service for maintaining the health of the forest. The Scouts suggested a modest monthly motivation allowance of Ksh. 15,000(£113) per scout; paramilitary training and thereafter adoption of some as rangers in KFS.

Lessons Learnt

- The **lesson learnt** during this project is that community scouting is a critical operational contact point between the community and the forest and government organs managing the forest resources.
- **Volunteerism is already working but spin off opportunity will be lost if the time is not adequately compensated for the community** forest scouts. The Youths need some motivation to get the benefit of their work and meet their personal obligations**.** Therefore beneficiaries of overall forest service's/forest ecosystem services should be taxed to sustain continued flow of those services

CASE STUDY 4: Conserve soils and water sources using Michai chai (asteria spp) grasses

Introduction

Lanzi village is among the five villages in Kibungo Juu ward, faced with watershed degradation with increased soil erosion, reduced water holding capacity, increased sediment loading and subsequent deterioration of water quality and quantity. All these together with traditional methods of farming systems have caused loss of soil fertility and low moisture contents hence low crop production. This has made CARE Tanzania and WWF TCO implement EPWS project to conserve soils and water sources. Various measures are promoted for that including *fanya juu* and bench terraces. These terraces when excavated are being stabilized by use of stones and grasses such as Michai chai (*asteria spp*). Michai chai grasses are available at local area for many years now which are being used as flavour to tea.

Insofar as Michai chai grasses are now getting new uses to the communities, there is interesting observation by Mrs. Isdonia Mwenda (aged 28) that 'Michai chai (*asteria spp*), now poses high demand in the villages. "Most farmers who excavate terraces use the grasses both for strengthening their ridges, and flavoring tea", she reported. Mrs. Isdonia is a single family mother, with one son living in Lanzi village. Apart from being a farmer who involves herself in Soil and Water conservation activities under EPWS, she also serves her community as a volunteer pre-primary school teacher.

"We have started buying this grass at prices between 500 to 1000 TShs depending on the quantity required. This is very new to this village and those who have these grasses will gain some incomes in this period",

This type of grass in the past was given less attention as only few local people used its leaves to flavour tea and there were no costs involved when obtaining it as spice or for propagation purposes. With the introduction of bench terrace and *fanya juu* farming practices among the community members, the plant is now becoming a commodity and demanding resource. Mrs. Isdonia Mwenda said, "we have started buying this grass at prices between 500 to 1000 TShs depending on the quantity required. This is very new to this village and those who have these grasses will gain some incomes in this period".

Figure 12:Mrs Isdonia Mwenda

It is hoped that with the increase of bench terraces and *fanya juu* ridges, will automatically increase the demand for the *Astoria spp* to stabilize the edges of terraces, but also contributing to farmers' earnings for those who selli it. It is the belief of EPWS project that the production of this grass will increase in short period of time to meet the demand. This also indicates that excavated terraces will be sustained to control soil erosion and increase soil moisture to produce more crops. This will thereafter ensure food security at local area and district at large.

5.0 DOCUMENTING BEST PRACTICES IN INTEGRATED NATURAL RESOURCE MANAGEMENT APPLICABLE TO MRB

5.1 CONSERVING WATER CATCHMENTS

5.1.1 SUSTAINABLE CHARCOAL BURNING

Name of Better Practice: SUSTAINABLE CHARCOAL BURNING

Better Practice Location: VI Agro forestry partners in Musoma Tanzania

Background/Need

Lack of energy is one of the main obstacles to development in low-income countries. Global energy use is highly unequal. The majority of our target group uses fire wood or charcoal as their only energy sources. Although a renewable energy source, it has serious negative health effects, respiratory infections being one of the most common and serious illnesses among especially women and children. In addition, the use and production is normally unsustainable, putting great pressure on ecosystems, causing erosion and water deficits. It is urgent to look for sustainable production methods together with

investing in alternative energy sources such as solar, biogas and wind since that has a potential to improve the livelihoods of the poor and sustain.

Figure 13:Charcoal burning in MRB posses a big threat to the environment

Description:

Sustainable charcoal production basically involves helping the charcoal burners to think about planting trees rather than felling trees for burning charcoal. It is **a change of mindset approach** to the problem. The approach starts with promoting tree planting that will be used for charcoal burning (in half to one acres of land). Second by helping them understand the maturity of trees, most of the time they harvest immature trees. They eventually know how to identify mature trees and the ones suitable for charcoal burning. The charcoal burners are then shown efficient ways of burning e.g. through the kilns .The charcoal burners are then taken through fuel efficient cooking stoves and how to promote these among charcoal users. The VI trains field officers who visit the farmers and charcoal burners and train on the sustainable charcoal burning methods. At the core of this approach is helping the charcoal burners and charcoal users to think different about the charcoal. **THINK DIFFERENTLY about what you have been doing and DO IT DIFFERENTLY!**

Figure 14: Vi staffs demonstrating improved charcoal burning methods to their fellow staffs at the Vi Agroforestry Training Center, Musoma .

Figure 16: Use of Improved stove helps in energy saving

Figure 15:

In order to engage people in sustainable charcoal production, promote tree planting for charcoal with specific emphasis on trees that are good for charcoal production. Train the producers on harvesting mature trees and efficient burning process i.e. in Kilns. Eventually train on fabrication of charcoal saving stoves. The charcoal remains from kilns are used to enrich tree nursery beds which act as pesticide against fungal diseases. This practice reduces fuel up to 60% and hence conserves the environment. The sites where clay has been mined are planted with sugarcane and woodlot to restore degraded areas to their original state. Energy saving jikos are distributed to the community members who are then trained on how to use them. Tree nurseries have been established to provide both indigenous and exotic species of trees for rehabilitation of degraded catchment areas, conservation of riparian reserves, provision for domestic needs as well as income generating through the sale of seedlings has lead to the general improvement of the environment. With respect to this, most conservation groups have been donating tree seedlings to schools, churches, hospitals and other institutions with the aim of reaching out to a wide network in the community and hence ensure environmental sustainability. In addition to this, there has been reduction in indoor pollution hence improved the general health condition of communities.

Implementing the Practice

- o Identification of farmer groups and individual farmers dealing with charcoal burning
- o Group sensitization and awareness raising
- o Training identified groups and individual charcoal burning dealers on sustainable charcoal production(described under the introduction)
- o Follow up and evaluation

Results

o Reduced stress on natural resources through increased production and improved utilization of sustainable energy
o After training field staff (knowledge and technology transfer to farmers) some charcoal burning dealers in the areas are operating are already using some of the improved charcoal burning techniques. This has given a chance for the project to concentrate more tree planting and training charcoal makers on the criterion for selecting suitable trees for charcoal burning

Success factors

o Number of farmer groups and individuals using improved charcoal burning methods/techniques
o Number of households and or farmers groups planting trees for sustainable charcoal production
o Number of farmer groups and households harvesting matured trees for charcoal burning

Sustainability/ Replication strategies

o Community facilitators; Communities are selecting persons to be trained as community facilitators (peer educators) at an early stage of implementation and cutting across all components. The project continuously develops the capacity of the community facilitators in new technologies and practices
o Partnership and collaboration: Vi Agroforestry project is collaborating with stakeholders and partners among them local communities and farmers' organisations, both at the local, national and regional levels which ensure joint ownership of the activities and reduce the perception of looking at the whole initiative as being project driven.
o Local seed collection: Farmers own local seed collection is trained and encouraged by the project. Seedling production is based on needs and demand from households concerning species selection and tree usage (timber, charcoal, firewood, etc.). The project encourages cost sharing in the production of tree seedlings.

Location of the practices

o Selection of the areas depends on the needs of the local people based on their economic activities.
o Currently the project has given priority in Rorya district (Girango and Luoimbo zones) where charcoal burning is most common and more trees are fell down for charcoal production
o Tree planting as a core activity under agroforestry practices is being emphasized in all areas where the project is operating

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5.1.2 TOBORA SUBCATCHMENT WATER USER ASSOCIATION

Name of Better Practice: MANAGEMENT OF WATER CATCHMENT THROUGH COMMUNITY EMPOWERMENT, TOBORA SUB-CATCHMENT WATER USER ASSOCIATION

Location of the Better Practice: Mugumu

Introduction

The management of water resources has been mandated to the water catchment basin Authority within Tanzania. The Tanzania mainland has nine water catchment basins country wide. Every catchment basin is characterized by the head water (upper basin) which is the source for the river, middle basin and lower basin. To have effective management of the water catchment within the basins, the basins are further sub-divided into sub –catchment basin with geo-references on the particular river system.

In recent times water resource management and conservation has been facing challenges as a result of water mismanagement and poor water governance. The mismanagement are due to increased human population coupled with increased demands on water uses that is superimposed by livestock grazing on water sources particularly river banks and wetlands. This overstocking of livestock is causing soil erosion and wetland degradation. Water pollution from human induced activities and siltation are among potential threats facing water resource management. The unsustainable agricultural practices contribute to erosion and siltation of water sources affecting sustainable water resource management. Unsustainable irrigation projects accompanied by forest encroachment at the upper catchment have recently been identified as the major contributory for dry-out of rivers. In order to address the emerging challenges facing water resource management, the Government of Tanzania using the newly enacted water Act of 2009, decide to empower local people on the water use management and conservation. The Tobora sub catchment water under the custodians of local people is among the best practices as a result of the decentralization of power being implemented in the Serengeti District within the SMME.

Implementation of the Practice

The Tobora sub-catchment basin is composed of seven wards consisting of 17 villages with mandate to manage the Tobora water catchment. The WUA has developed a constitution that provides legal backup for the management of the sub-catchment and allocation of water to different users. The management plan has also been developed to guide the implementation of activities in water resources management. There is a governing board composed of the Chairperson, Vice Chair, general Secretary and the treasurer formed by village and wards leaders. The main activities of the sub-catchment practices are protection of water sources, tree planting (those which consume little water and fertilize the soil), use of energy efficient stoves, and contour farming to control soil erosion.

Success Factors
- Willingness of communities to participate on the management and conservation of the sub-catchment basin
- Taping of water for use from a distance from natural springs within the sub-catchment basin.

Outputs and Outcomes

- Constitution prepared and is operational
- Use of sustainable fuel efficient stoves (improved stoves) to minimize pressure from the forest
- Development of management plan
- Introduction of sustainable land use management practices such as use of farm yard manures, tie ridges, water catchment structures and planting trees at the catchment area.
- Existence of protected Water sources

- Involvement of the community on contour farming and tree planting programme.
- Local communities have accepted to practice organic farming as a measure to minimize water pollution

Effective Channels for dissemination this practice
- Study tours/exposure
- Awareness creation and education
- Workshops and seminars
- Publications
- Development of promotional materials such as leaflets and brochures
- Mass Media through Television and Radio broadcasting

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5.2 RIVERBANK MANAGEMENT

RIVERBANK MANAGEMENT PRACTICES
Good Practice: LIVELIHOOD AND CONSERVATIN APPROACH IN RIVER BANK MANAGMENT
Background:
Rivers and streams are products of water catchments. They are often referred to as dynamic systems which mean they are in a constant state of change. The factors controlling rivers and stream formation are complex and interrelated. These factors include the amount and rate of supply of water and sediment into stream systems, catchments geology, and type and extent of vegetation in the catchments. As these factors change over time, river systems respond by altering their shape, form/or location.
Stream banks erosion

Stream bank erosion is a natural process that over time results in the formation of the productive floodplains and alluvial terraces common to the middle and lower reaches of our river systems. Events such as flooding can trigger dramatic and sudden changes in river and streams. Similarly, over clearing of catchments and stream bank vegetation, poorly managed sand extraction result in accelerated rates of bank erosion can also result in sudden changes in rivers.

Other factors that have contributed to river bank erosion/degradation include:

- Population increase
- Change in land use
- Increase in agricultural land (food)
- Vegetation degradation/depletion (wood products)
- Livestock (fodder)
- Rules and regulations (not followed).

In the case of Mara river Basin, its catchment area in the Mau Forest has had challenges as shown below.

Figure 17:Increase in agricultural development in the Mau complex over time: spread of the purple colour
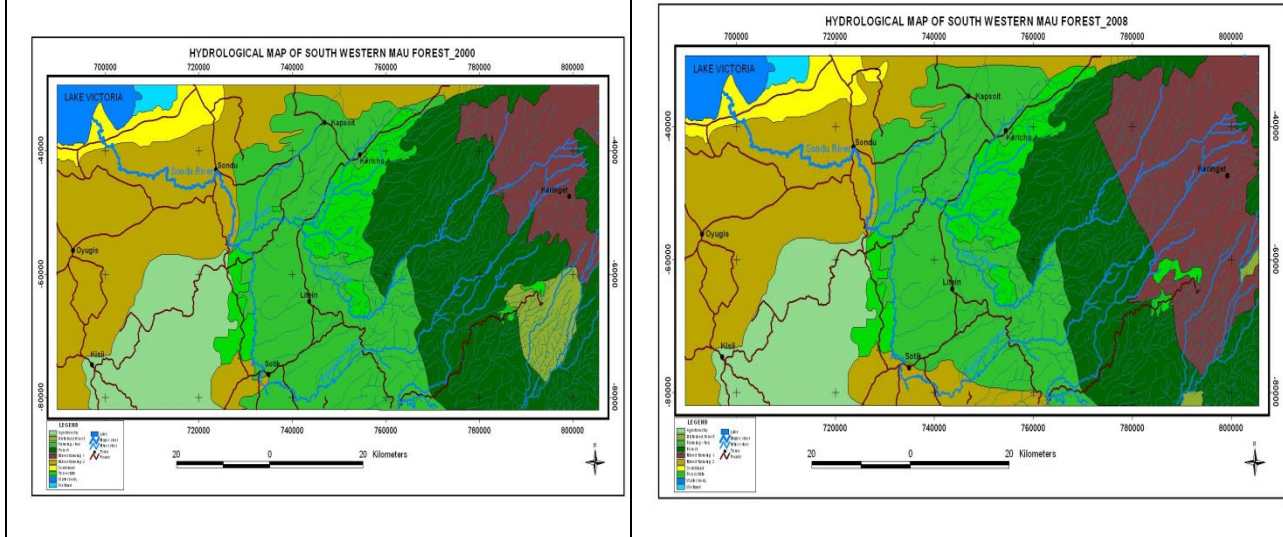
Figure 18: Extent and intensity of watershed degradation: 1986 – 2008 Source: LVBC INRM training Report,2011)

Land Cover	Area (ha)		
	1986	**2000**	**2008**
Farmland (upstream)	50,817	52,747 3.8 %	99,823 (96.4%)
Forest	152,937	146,640(-4.1%)	114,027 -25.4%
Distributed Forest	14,905	17,685 (18.7%)	1,760 (-88.2%)
Tea estates	34,706	35,765(3.1 %)	38,996 (12.4%)
Tea Farms small holders	134,543	135,762 (1%)	124,589 (-7.4%)
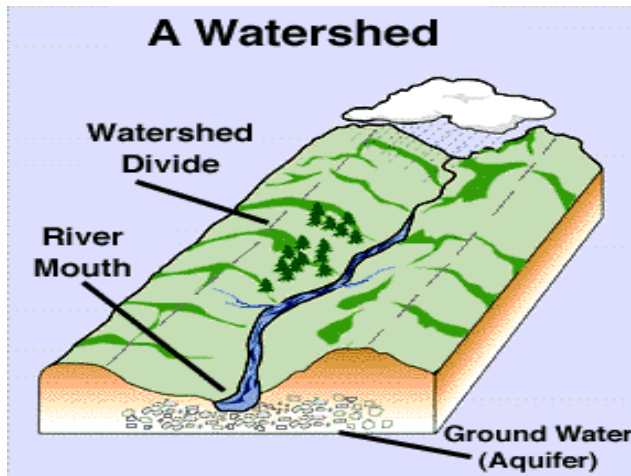
River Bank Erosion accelerators

- Stream bed lowering
- Stream bed lowering
- Saturation of banks from off stream sources (Shamba)
- Redirection and acceleration of flow around infrastructure, stream channels, obstructions,
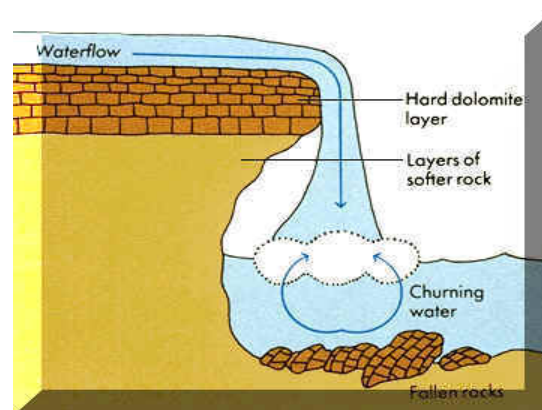
Removal or disturbance of protective vegetation from stream banks as a result of trees falling from banks or through poorly managed stock grazing, clearing or fire

- Bank soil characteristics such as poor drainage /readily erodible material

- Wave action generated by wind
- Excessive sand harvesting
- Intense rainfall event

Impact of vegetation degradation on Environment and local livelihood

- Loss of top soil leads to soil fertility depletion, reduced crop yield and food insecurity
- Loss of riverine forests and biodiversity – birds, animals and plants occupying riverine forests
- Deforestation destabilizes river banks causing erosion and flooding
- Water pollution and contamination by agricultural residues
- Increase in incidences of flooding
- Accidents and potential hazards caused by abandoned pits and caving in of unstable banks

Figure 19: Interventions for improved river bank management

Good Practice A**:** River / stream bank Stabilization

a) Using natural vegetation - trees, shrubs and grasses.

Figure 20:Shrubs planted next to a stream bed

Figure 21:Willows planted on a stream bank

Figure 22: Use of vetiver grass(left) and Bamboo(right)

Use of bamboo

Bamboo is a type of grass which does very well in the highland areas. It consists of several species e.g. *Arundinaria spp, Bambusa spp Dendrocalamus spp w*hich grows to a height of 60-100 metres high. Bamboo as grass has several domestic and commercial uses e.g. fresh shoots for vegetables O.abyssinica, for house constructions furniture, fencing poles, ceiling boards, tourist attraction, medicinal.

Apart from the above bamboo is very effective in reducing environmental degradation e.g. soil erosion by tying up the top soil.

Due to increasing need for use in catchment areas and erosion prone areas the easier method of raising the bamboo planting material would therefore facilitate the rehabilitation.

Good practice b: Nylon bags are filled with soil or sand and placed on the river/stream bank to control soil erosion and flooding.

Benefits of using fodder
• Deep rooting systems able to hold the soil
• Fodder for livestock
• Can earn income by selling fodder
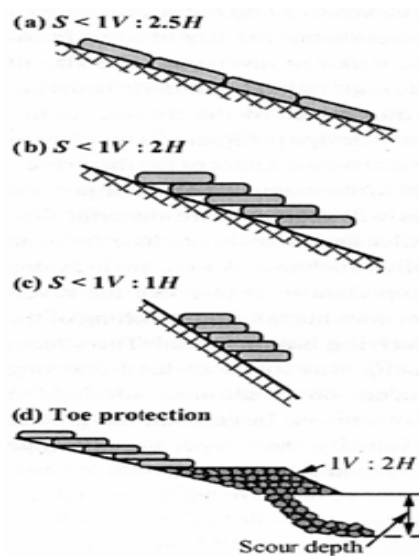
Figure 23: Blocks made of concrete are used to cover the surface of unstable soil to control erosion. The blocks have openings to provide for drainage and allow vegetation to grow

Using gabions

Figure 24: Rectangular wire boxes / baskets are filled with small-sized stones and used to control soil erosion on unstable banks.

Good practice c: **Rooting architecture: mixing shallow-rooted plants e.g. grasses and sedges and deep-rooted plants e.g. trees and shrubs**.

Figure 25:Rooting architecture: mixing shallow-rooted plants e.g. grasses and sedges and deep-rooted plants e.g. trees and shrubs to control soil erosion

Shallow rooted plants hold together the unstable top soil hence controlling soil erosion. They also reduce the rate of flow of runoff thereby allowing for more percolation**.**

Deep rooted plants hold together several soil horizons making the soil very stable. They also aid in the percolation of water into deeper horizons of the soil thereby controlling flooding by reducing the amount of water that flows on the surface as runoff.

Good Practice c: SOIL FORMATION AND RESTORATION

- Planting both deep rooted trees and nitrogen fixing plants to penetrate and help to loosen the compact soil for future agricultural activities.
- Preference should be given to tree species with economic benefits e.g. nitrogen fixation, fuel wood, timber, fodder and fruit trees
- In case the abandoned site is located along a river bank, river bank stabilization approaches must be given priority.

Good Practice d: Alternative land uses as river bank management strategy

Agroforestry can be promoted to replace trees felled for baking clay products, and also as an alternative source of income, fuel wood and construction materials. Most clay and sand harvesting sites along riverbanks have great potential for **bird watching**, **scenic viewing**, **camping**, **photography** and **picnicking**. However, their **recreation and eco-tourism** potential have **not been exploited**. These can be explored and incorporated into the Mara river tourism circuit.

Figure 26: Agro forestry, seedling sale

Figure 27: Agro forestry, seedling sale Bee-keeping is equally a source of income

Figure 28:There is still more opportunities for Eco-toursim

Figure 29:Bird-watching has not been exploited to the fullest

High population density
Poor soils-nutrient deficient soils,
Low income,
Scarcities of timber and other wood products,
Soils are poor in nutrients- N and P
Continuous cropping with little or no inorganic fertilizers, poor mgt practices
The high cost of inorganic fertilizers-inaccessible

GOOD PRATICE: FERTILIZER TREES FOR FOREST CONSERVATION AND BETTER LAND MANAGEMENT

INTRODUCTION AND BACKGROUND

Organics are of unavailable and of poor quality. Most farmers in the region cannot obtain more than a ton of maize grain from a hectare of land in a year. The result of all this is food insecurity, lasting between 3-9 months per year in many farmers.

Agricultural production: the handicaps

- Degraded soils
- Low crop yields
- Hunger
- Limited extension services
- High prices of ferterlizers
- Unstable market prices
- Low labour productivity

Figure 30: Agricultural produce in the field

SOIL FERTILITY ISSUES

- There were two innovative agroforestry technologies used to tackle soil fertility problems in complementary ways:
- One involves planting short duration fallows with leguminous species such as *Sesbania sesban*, *Crotolaria grahamiana* and *Tephrosia vogelii*.

IMPROVED FALLOWS

- Improved fallows entail the planting of one or a few trees species as a substitute to natural fallows to achieve the benefits of the latter in a shorter time (Prinz, 1986; Young, 1997 cited in LVBC INRM training report, 2012).
- Planted improved fallows have the potential to ameliorate soil fertility and increase carbon pools

Figure 31:Crotolaria Fallow	Figure 32: Leuceana Fallow

Figure 31:Crotolaria Fallow

Figure 32: Leuceana Fallow

LEUCEANA FALLOW

Figure 33:Commonly known as Mexican sunflower) is grown around and within farms to mark boundaries or as contour hedges

- **Nitrogen fixation potential (kg/ha)**
❖ Cajanus cajan (**164**)
❖ Crotolaria grahamiana(**199**)
    ❖ Macroptilium atropurpureu(**158**)
❖ Sesbania sesban(**124**)
❖ Tephrosia vogelii(**173**)
❖ Limitations on phosphorus***
❖ Significant increases in **soil organic matter (SOM)** have been obtained with fallows of pigeon pea (*Cajanus cajan*) on degraded soils of western Kenya (Onim et al., 1990), single and mixed species (Ndufa, 2001).
❑ Other fertilizer/**green manure** is from common

local weeds that grow abundantly on **boundaries and roadsides.** For instance *Tithonia diversifolia* (commonly known as Mexican sunflower) is grown around and within farms to mark boundaries or as contour hedges.

TITHONIA DIVERSIFOLIA

Major problem with implementing sequential agroforestry systems in general

1) Farmers have to **forego growing crops** during the fallow phase
2) **Pests and diseases** are other keys issues that deserve to be addressed
3) Lack of **germplasm** for most improved fallow species
4) Most species have **no food value**
5) Lack of **technical information** to wider clientele

REPLICATION AND SUSTAINABILITY

1) **Germplasm development** for improved fallows (Seed multiplication plots)
2) Appropriate strategies for **dissemination**
3) Effects of fallows on **neighboring systems**
4) Identification of **more species** for improved fallows (fallows performance in relation to **environmental factors** such as quantity and duration of rainfall, soil chemistry and pests
5) Research should investigate **a broader range of species** that are easily established, are less prone to pests and diseases, provide a range of fallow by products and coppice on fallow clearance
6) **Nutrient accumulation** in both soil and vegetation need to be studied

5.3 WILDLIFE MANAGEMENT

5.3.1 MANAGEMENT OF WILDLIFE BY DECENTRALIZATION THROUGH DEVOLUTION OF POWERS TO LOCAL COMMUNITY

Name of Better Practice: MANAGEMENT OF WILDLIFE BY DECENTRALIZATION THROUGH DEVOLUTION OF POWERS TO LOCAL COMMUNITY

Location of Better Practice: Ikona Wildlife Management Area

Introduction

In the 1992 Rio Summit on Environment and Development, the marginalization of local communities on wildlife conservation initiatives particularly on benefit sharing was discussed and decision made on the need to devolve power to local communities to manage and conserve natural resources including wildlife. Concurrent habitat loss, fragmentation and degradation were the main factors identified to threaten the future conservation of biodiversity. Since 1998 Tanzania pursues a decentralization reform (Local Government Reform Policy – LGRP), in which political, administration, and fiscal responsibility is conferred from central government to Local Government Authorities (decentralization by devolution – „D-by-D"). The objective of the LGRP is to empower local governments to provide accountable and transparent service delivery and poverty reduction interventions in their areas of jurisdiction, especially to the poor.

Before 2009, there was no legal protection of wildlife migratory corridors, open areas and dispersal areas. The lack of law to govern the management of these areas resulted into conversation of these lands into agricultural and settlement lands that in turn caused increased human wildlife conflicts. Furthermore, the communities surrounding protected areas were less involved in the management of wildlife and benefit sharing as a result of wildlife conservation activities. This caused communities to label wildlife as liabilities rather than an asset. The little benefit derived from wildlife in protected areas used to address community development at village level at the expense of the house hold livelihood. Failure to recognize and reconcile the potential role of local communities in wildlife management threatened the integrity of ecosystems.

The introduction of CBC/WMA was the measure to improve the community's livelihood through devolution of powers and mitigating wildlife migratory corridors and dispersal areas from other land uses while improving wildlife conservation and sustaining ecosystem health. The IKONA WMA is among the community based wildlife management practices in Tanzania found on the western party of SENAPA and is located between the Ikorongo-Grumeti game reserves. The programme is owned and managed by five villages namely the Robanda, Nyigoti, Nata, Makundusi and Nyichoka. The two tribes, the Ikoma and Nata constitute the name of the practices (IKONA- Ikoma and Nata people). The objective of the introduction of Ikona WMA was to improve wildlife management outside protected areas through livelihood driven approaches by enhancing the health of the Serengeti Maasai Mara ecosystem.

Implementation of the Practice

The main activities of the Ikona WMA are to manage wildlife through patrols and tourism activities. The WMA is managed by the management plan and management zoning scheme whereby there two zones,

the tourism photographic zone and the tourists hunting zone. Protection of the resources within the areas is carried out by trained village scout whereby photographic tourism is undertaken through game drives and concessionaires from tourist facilities. The hunting quota allocated by the government is exchanged with money from the Singita Grumeti Fund. Therefore the hunting within the WMA is restricted and the villages get money (Tshs190,000,000/- per year/or $ 120,250 USD) from Singita Grumeti fund in exchange to the hunting quarters. Fifty percent (50%) of the revenue collected from the Grumeti Fund goes to the villages for development projects while the remaining money is used for WMA management activities. Moreover the Ikona WMA collects about TShs. 1,000,000,000 per year from tourism which is equivalent to about USD $640,000 .

The implementation of the WMA is carried out by the governing board with mandate to make decision on behalf of the communities of the five villages. The District council plays a professional standard and technical advisory role to the practices due to its capacity. There WMA has employed a general secretary who also acts as the treasurer for the WMA who is the executants of day -to -day activities. There are other collaborators within the WMA which among others includes FZS, Grumeti Fund and TANAPA.

Outputs and Outcomes

Employment: The Ikona WMA has provided employment opportunities to the community both self and non-self employments. The WMA has a total of about 30 employees while the tourism investments in camps and lodges has also created about 50 jobs to local communities.

Income: The practice is generating about 1,000,000,000 Tshs per year equivalent to 640,000 USD as annual income that is vital to the community and the national at large. Also the tourism industry within the areas provided markets to local produce and development of art-craft industry that generates money to the local people which is estimated to be about 20% of the annual income from the WMA.

Education: Through the practices all (or some) the school children without financial support are provided with school fees from the project. The project has formulated education fund to carter for tuition fees and other requirements for students at various level. A total number of 30 children has been provided with an opportunity to pursue primary and secondary education in the five villages

Development Projects: Through the practices, the villages are supported with construction of social facilities such as school buildings and offices. Since its commencement, 14 classrooms, 8 teacher's houses, 3 dispensary wards, 1 dispensary, 3 toilets, 2 dormitories for women students and one cattle dipping station have been constructed in various villages participating the practice.

Reduced Poaching of Wildlife: The WMA has provided people with livelihood opportunities within the five villages resulting to reduced poaching activities. With alternative source of livelihood, these groups no longer engage in hunting/poaching.

Success Factors

- Willingness of the communities to the management and conservation of wildlife within their village land
- People were sensitized to restrict hunting of wildlife for any use instead is provided with money as compensation.

- The interests and commitment of both villages on wildlife management were built into project design and management;
- Diverse approaches were used to draw wide participation to promote changes in attitudes and perceptions in relation to wildlife management and conservation.
- Training conducted to committee members, village governments as well as village game scouts

Challenges

Despite to the success stories noted from the WMA since its inception in 2007, still it is faced with some challenges. These challenges among others include:

- Inadequate education awareness to villages on wildlife conservation and benefits sharing mechanisms affects the implementation of conservation activities.
- Inadequate resources in-terms of equipments, human resources and financial resources. The rangers are fighting poachers without using weapons, therefore exposing themselves to a greater risk. Similarly, the inadequacy financial and human resources hinders the WMA from achieving her intended objectives.
- Bandits. The recent two events from bandits have negative impact on tourism and visitors use and experience within the Ikona WMA.

Effective Channels for dissemination this practice

- Study tours where communities wishing to start similar visit IKONA WMA
- Awareness creation and education
- Workshops and seminars
- Publications
- Development of promotional materials such as leaflets and brochures
- Media such as Television and Radio broadcasting

Transferability/Replication

More attention to be given to awareness creation and education of the communities wishing to start their own WMA. They should visit a functional WMA and have first hand information and discuss freely with the groups, the benefits and challenges and how to navigate the challenges.

Contact address for the better practice

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5.3.2 COMMUNITY AREA MANAGEMENT PROGRAM FOR INDIGENOUS RESOURCES CAMPFIRE

Name of Better Practice: Community Area Management Program for Indigenous Resources CAMPFIRE

Location of Better Practice: National Parks in Zimbabwe

Introduction

Almost 5 million people live in arid and semi-arid communal lands covering almost half of Zimbabwe. Despite the dryness and difficult conditions, a wide range of wildlife is also found here. CAMPFIRE (Communal Areas Management Programme for Indigenous Resources) is a programme designed to assist rural development and conservation. It works with the people who live in these communal lands, supporting the use of wildlife as an important natural resource. CAMPFIRE is helping people in these areas manage the environment in ways which are both sustainable and appropriate.

National Parks in Zimbabwe

Today 12% of Zimbabwe is protected as conservation areas or National Parks. Some animal species have prospered so much in the protected areas that they are causing serious environmental damage e.g. elephants. Some species are also suffering genetic problems because of inbreeding.

Many local people were evicted from their homes when the Parks were created. Most now live in the surrounding communal lands. They are no longer permitted to hunt the animals and harvest the plants now found inside protected areas. However, animals frequently roam outside Park boundaries, destroying crops and killing livestock and sometimes people. This has created much conflict between local people and National Park staff, often resulting in illegal hunting. Over 100 people have been killed by elephants or buffaloes in Kariba since 1980. Therefore, local people generally considered wildlife to be a nuisance, not a resource.

Rationale and application

CAMPFIRE formed to raise awareness and money

The CAMPFIRE movement, designed and managed entirely by Africans, began in the mid 1980's. It encourages local communities to make their own decisions about wildlife management and control. It aims to help people manage natural resources so that plants, animals and people - the whole ecosystem - all benefit. It helps provide legal ways for such communities to raise money by using local, natural

resources in a sustainable way. As a result, many communities now actively protect local wildlife, seeing it as a valuable asset. In some areas locals have even provided them with emergency food and water in times of shortage.

Five main activities help provide extra income to local communities:

- **Trophy hunting:** About 90% of CAMPFIRE's income comes from selling hunting concessions to professional hunters and safari operators working to set government quotas. Individual hunters pay high fees to shoot elephant (US$12,000) and buffalo and are strictly monitored, accompanied by local, licensed professionals. Trophy hunting is considered to be the ultimate form of ecotourism, as hunters usually travel in small groups, demand few amenities, cause minimal damage to the local ecosystem, yet provide considerable income.
- **Selling live animals:** this is a fairly recent development. Some areas with high wildlife populations sell live animals to National Parks or game reserves e.g. Guruve district raised US$ 50,000 by selling 10 roan antelope.
- **Harvesting natural resources:** a number of natural resources e.g. crocodile eggs, caterpillars, river-sand and timber are harvested and sold by local communities. Skins and ivory can be sold from 'problem animals' (individual animals who persistently cause damage or threat and can legally be killed).
- **Tourism:** in the past most revenue from tourists has not gone to local communities. During the 1990's pilot projects have been set up and 5 districts now benefit from tourism. Development of specialist areas e.g. culture tourism, bird watching and visits to hot springs are planned. Some local people are employed directly as guides or run local facilities for tourists.
- **Selling wildlife meat:** where species are plentiful e.g. impala, the National Parks Department supervise killing and selling of skins and meat. However, this only raises fairly small sums of money.

Organisation

Each village taking part in the CAMPFIRE project (now covering 26 districts) has a wildlife committee responsible for counting animals, anti-poaching activities, conflicts which arise through 'problem

animals' and environmental education. Game scouts are trained to help stop poaching and manage wildlife.

Quotas

For hunting concessions to be granted and wildlife managed sustainably, local communities need to monitor their wildlife populations and manage their habitats, protecting them from poaching or alternative forms of land use e.g. farming. Every year the Department of National Parks helps to estimate the wildlife population totals so that sustainable quotas can be set.

Counting can be carried out in a number of ways. One (expensive) way of counting large animals e.g. elephants, is by aerial survey. WWF carries out aerial surveys every 2 years in some districts with high elephant populations; every 5 years in districts with smaller numbers. Other data is provided by professional hunters and tour operators who know local populations particularly well. Villages also carry out surveys, mapping sightings on a monthly basis. This includes the type, number and sex of each animal (where possible).

Workshops are held annually so that all data can be shared and estimates made for the year. These, plus the carrying capacity for each area, form the basis for setting sustainable quotas for hunting and harvesting. At present quotas are issued by the Department for National Parks.

Tour operators must, by law, keep detailed records of animals killed e.g. size, weight, length of certain animals and/or horns and tusks. This helps check that young animals are not being taken, putting future numbers at risk. New quotas are not issued until operators produce these records for analysis by the Department for National Parks. Local communities may also apply to kill (or sell concessions on) what are known as 'problem animals'.

Benefits sharing: Where the money goes

Income is collected and distributed by District Councils, using guidelines produced by CAMPFIRE. They suggest that:

- 80% of the money is given directly to local communities who should collectively decide how it should be spent
- 20% is used by the District Councils for administration and managing the local CAMPFIRE projects

District Councils are accountable to the government via the Department for National Parks. Over US$1.4 million was raised by 26 Districts which ran CAMPFIRE projects in 1993, although amounts vary considerably from project to project.

In good years money is used for the general community e.g. building and equipping clinics and schools, constructing fences, drilling wells, building roads, paying guides and funding local sports teams. In bad, usually drought, year's money is given directly to local people or used to buy maize and other foodstuffs. Since 1989 over 250,000 Zimbabweans have been involved in CAMPFIRE projects.

The Results

There are many advantages to the community-based management approach adopted by CAMPFIRE:

- communal lands can act as game corridors between existing National Parks, protecting the genetic diversity of wild species
- it creates jobs - local people are trained and become involved as environmental educators, game scouts etc
- it prompts environmental education and promotes the benefits of wildlife conservation to communities
- it provides an incentive for people to conserve wild species
- it generates funds, which are used for community projects or to supplement household incomes
- it creates more revenues for wildlife management and conservation projects in areas that would otherwise not receive adequate financial support for conservation

In order to advance CAMPFIRE conservation efforts, further technical assistance will be needed by rural communities. They would also benefit from secure land tenure and rights over their wildlife. In addition, the ability of CAMPFIRE to assist wildlife conservation in Zimbabwe depends on several wider factors:

- the acceptance of hunting as a wildlife management tool by the international community
- placing economic value on wild species
- exploring different ways of realising that value, such as through wildlife tourism, trophy hunting and game ranching "

Challenges

- Weak local government agencies in terms of finance
- Political chaos, violence and population growth.
- Local NGOs are weak and inexperienced

- Living in unproductive areas

- Trade in ivory

- Devolution of powers to local communities

- Deepened poverty

Box 8: Lessons Leant from CAMPFIRE PROJECTS

- Empower rural community for conservation and sustainable development through harvesting natural resources
- There are profits from trophy hunting, tourism hunting concession to foreign hunters, profit harvesting natural product e.g. antelopes and crocodiles eggs.
- Incentives and profits to local community empower them to participate in conservation of wildlife.
- CAMPFIRE enabled local communities to make better use of their unproductive community land which is excellent habitat for wildlife.
- Integrate goals of conservation, sustainable development and community participation to ensure success for community wildlife management programmes.
- Protected area approach is good for sustainable management of certain species.
- Benefits go direct to those who pay assessment costs e.g. by local community allocation of land, crop losses, animal injury, death e.t.c
- Effective management of natural resources is best achieved when focused on creating value for those who live with resources.

Contact Information for the Better Practice:

(Source: CAMPFIRE web site http://www.campfire-zimbabwe.org)

5.3.3 RANGER BASED MANAGEMENT SYSTEM

Name of Better Practice: Ranger Based Management System (RBM)

Better Practice Location:KWS, TANAPA

The Need/Background:

The objective of RBM is to regularly monitor a protected area by law enforcement staff in order to understand the illegal human use of the habitat (poaching etc), ecological processes in the PAs and distribution and habitat use of specific key species. The monitoring feeds directly into day-to-day management of the protected area and enables surveillance and specific interventions to be based on solid data. This can include where to send patrols, based on suspected activities of poachers, availability of seasonal resources and presence of snares. It can also include the movements of key species, such as elephants and their use of habitat. The RBM produces effective field maps for park staff and patrolling law enforcement staff using GPS coordinates. Data can be analysed for each protected area, as well as at the headquarters of the protected area authority. A centralized, regional database should be developed so that the data is available for the entire ecosystem, thus allowing the SMME to be managed as one ecological unit. This requires the standardization of the RBM datasheet across the protected areas within the Serengeti-Maasai Mara ecosystem.

Using the rangers to collect monitoring data along the routine protection patrols does not add substantial costs to the exercise. Monitoring will help to make the patrols more effective in terms of coverage and targeting. Moreover, the ranger patrols are cost effective because rangers work in small

Figure 34: Giraffe grazing in Maasai Mara Game Reserve. RBM helps day to day management of wildlife in protected areas.

Name:KWS HQ and TANAPA
Contact address: KWS, Serengeti National Park,
Phone, email, website: www.tanzaniaparks.com

teams, they travel faster (covering more ground), and minimizing potential impacts of their activities by following already established guidelines for use of human or wildlife trails.

At Transmara, some members of the community are trained as scouts and are facilitated with radio calls, uniforms, and badges for communication and security issues. These Game scouts also collaborate with the KWS office to curb poaching and they have powers to arrest and report those destroying the environment. In addition, they are also recognized by the provincial administration. The KWS trained the game scouts from the local community on MIST a computerized programme used by rangers in the field to update the current status of wildlife. The scouts have been provided with motor bikes and cell phones for patrol. The scouts work jointly with the wildlife rangers, although not formalized thus ensuring resource ownership.

Contact Information for the Better Practice:

5.4 SOIL AND WATER CONSERVATION

5.4.1 SUSTAINABLE AGRICULTURAL LAND MANAGEMENT

Name of better Practice: Sustainable Agricultural Land Management

Location of better Practice: These are practices being carried out of farmer's farms under the Integrated Watershed Management Project I Mt Elgon and Chepais Districts,in Kenya and In Tanzania: Done in all zones (Rorya, Tarime, Bunda and Ukerewe Districts).

Introduction and background
Mount Elgon catchment was once thriving with dense indigenous forests where people lived and extracted resources for day to day activities. However, over time there has been a rise in population which has constrained the natural resources especially trees. Thus people have harvested the indigenous trees for commercial purpose leaving land bare and susceptible to erosion. This has called for the introduction of sustainable land management practices that will favor conservation of soil. Soil

nutrients have also been depleted in some areas that once had rich soils. The practices are meant to reverse the effects aggravated by human activities.

The areas that have been targeted for improvement through sustainable land management lies in the human settlements in on the slopes of the mountain. These are farmers that were settled by the government in the recent years. It comprises people in Kaptama, Kapsokwony, Kopsiro and Cheptais in Mt Elgon and Cheptais Districts.

Soil erosion and land degradation is a serious issue in Mt Elgon following years of poor farming practices. The result has been a rapid decline in crop yields, poor soil water holding capacity, increased incidences of disease and pests and loss of soil resulting in serious gullies and mudslide. Thus, farmers are forced to use a lot of inputs in terms of fertilizer to increase crop productivity and invest in costly soil erosion control structures. Depressed crop yields have exacerbated high levels of poverty among members of the population in spite of the good climatic condition.

The Sustainable Agricultural Land Management practices promoted are designed to meet the following objectives:
- reduce the rate of land degradation through erosion
-improve farm productivity for increased household income and improved livelihoods
-to improve the quality of the environment that favors sustainable human activities

Implementation of the Practice
In sustainable Agricultural land management practices, some of the activities carried out include:
- **Terracing** – where structures are built across the slope to reduce speed of run-off and retain soil that would rather be transported down-slope
- Mulching – practice of covering the soil with organic material to retain soil moisture, reduce rate of runoff and retain soil

- **Crop rotation** – practice of growing different crops in different seasons to interfere with disease and weed cycles
- **Alley cropping** - growing crops in strips across the slope to reduce run off and control soil erosion
- **Cover crops** – growing crops that provide herbaceous soil cover to control run off and reduce incidences of erosion

The activities have been carried out among the farmers living on the slopes of the mountain in the two districts. The practices have been embraced by the households on the steep slopes where there is limited vegetation cover.

The activities were promoted by Vi Agroforestry on collaboration with the government line ministries especially the Ministry of Agriculture. The collaboration is for the period of one and a half years.

Other activities promoted by other agencies like Care Tanzania, Government extension officers include: Tie ridges construction; Micro catchment construction, Application of organic fertilizers among others.

The implementation of the practices has been achieved through active capacity building efforts facilitated by Vi Agroforestry. The support is in terms of facilitation fee, transport and meals. Selected

farmers are trained and are encouraged to share the experience with the rest of the community as a mean of scaling up the same.

Results of the Practice – Outputs and Outcomes

The expected results of the practices are

- Enhanced sustainability of farming systems
- Improved soil structure and fertility
- Enhanced crops and livestock production
- Improved food security and household income
- Reduced soil erosion
- Improved organic matter content
- Increased farm income
- Climate change adaptation and mitigation
- Increased access to water and prolonged growing season.

The outcome has been 3000 households implementing different SALMs that have contributed immensely to improved farming. More than 100 households have constructed terraces on their farms. There are 40 groups that are involved in common enterprises in crop production. A number of farmers have gone into improved farming after growing their income base, for instance purchasing cattle after sale of bumper harvest from onions.

Lessons Learnt

- Scaling up of good practices can be heightened if the community's capacity is enhanced/ built, they own the process and they undertake activities that will result in scaling up adoption of the same.
- Community working in group's increases cohesion, cross learning is thus enhanced
- Whenever there are success stories, there are persons who discourage others since they feel they have been left out due to bad attitude or laziness.

Replication of these practices pick up once the farmers see the fruits from the early adopters, therefore it is important to choose your point persons to try pilot the techniques/interventions very carefully (positive, open minded and with good risk appetite)

Assessment is ongoing based on the permanent farmer samples, a sampling methodology that tracks change in adoption rate for the selected farmers over time.

Success Factors

- Availability of resources [organic fertilizers, tree seeds and staff]
- Awareness creation done by Vi Agroforestry Project staff

- Willingness to implement by farmers
- Change in climate [prolonged drought and unpredictable rainfall seasons]
- Shortage of fuel wood and building materials has forced farmers to plant more trees.

Conclusion

For the farmers that have adopted most of the sustainable agricultural land management practices, they can confess increased from yield, improved crop performance and better returns from the harvested crops. Livelihoods have improved from housing, cost of living through to increased investment.

This is a good practice since one can see the impact of the practice on the farmers implementing compared to those not implementing. Furthermore, soil erosion control structures are effective in reducing soil losses and improve crop performance. The practice can also be learnt at the farmer level and adopted by the neighbor following experience of the impact of the practices on the farm.

Those who intend to adopt sustainable agricultural land management practices must be prepared to commit their time and resources in establishment of the same. Thus farmers require patience and embrace the attitude of wanting to learn for the fruits of their efforts to yield tangible results. Scaling up is easier is farmers can learn from their peers in the neighborhood who will stand out as model farmers.

Effective ways of disseminating the better Practice
- Farmer to Farmer visits (visiting early adopters)
- Technical staff regular backstopping mission to farmers

(g) Further Reading
i. Mount Elgon Integrated watershed management project Annual Reports, Vi Agroforestry.
ii. Case studies from Mount Elgon integrated watershed management project, Vi Agroforestry
iii. Case Studies Lake Victoria Regional Environmental and Sustainable Agricultural Productivity

GOOD PRACTICES IN SOIL AND WATER CONSERVATION

Introduction and Background

Soil erosion refers to the removal of the soil by agents of erosion (mainly water or wind). There are two types of soil erosion namely: Natural or geological erosion and accelerated erosion.

Natural or geological erosion is the gradual removal of soil be natural processes acting over very long time periods to produce the landscape seen today.

Accelerated erosion is the removal of soil at a faster rate than that which would occur under natural conditions with natural vegetation.

Causes of Soil Erosion

Figure 35:Splash Erosion

In most cases rain (water) and wind are the immediate direct causes of soil erosion

Splash Erosion

Some of the major causes of erosion are:

- **Clearing the land** and cultivating it without adequate/appropriate soil conservation measures.
- **Cultivation o**f **steep slope**.
- **Deforestation**
- **Cultivation of river banks:**
- **Improper farming practices**.
- **Road construction and road drainage**

Figure 37: Clearing the land and cultivating

Figure 36: Overstocking/Overgrazing
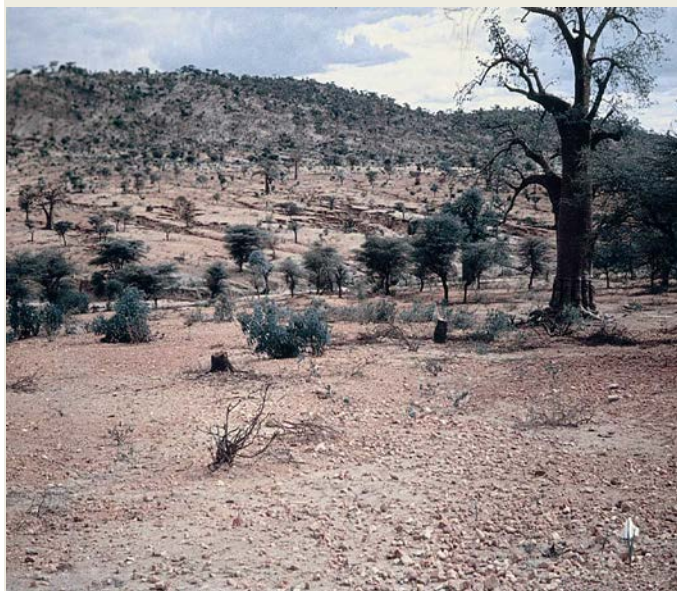
Consequences of Soil Erosion

- Reduce **soil fertility**
- Result in reduced **crop yield**.
- Reduction in **livestock carrying capacity**
- Reduction in **soil depth** and water holding capacity
- Reduction/**Depreciation** in value of land.
- **Endangering** of infrastructure e.g. roads, bridges, buildings.
- **Siltation** of streams leading to poor water quality, blocking and flooding of streams.
- **Siltation of dams** and power rationing

- Overall **environmental degradation**.
- **Soil /degradation/** depletion in the world.

SOIL CONSERVATION

Erosion is a function **of *erosivity* and *erodibility***. Erosivity is defined as the ability of rain to cause erosion and is outside our control. Erodibility depends partly on soil properties, which we cannot change and to a larger extent on land use and crop management. These last two are under our control and conservation deals with how we manipulate them to reduce erosion.

Soil Conservation Measures

- These are practices that influence and reduce erosion
- They can be divided into two types:

Physical soil conservation measures

Biological/**Cultural measures**

These control measures are not alternative but are complementary and are to be used together although each serving separates purpose.

Soil Conservation in cultivated land

- ❑ The opening of land for cultivation leaves the soil bare and vulnerable to splash and rill erosion.
- ❑ To protect the soil, the farmer and the conservationist have a range of measure to choose from

Biological/Cultural Measures

- **Farm Management**
  -SOIL

Maintaining soil clods through tillage Increases the rate of infiltration

Maintaining high soil fertility: (Crops grow faster and larger providing soil cover. This reduces erosion)

Maintaining high organic matter:- This increases aggregation of soil practices making the soil resistant to erosion

Maintaining high fertility ensures better crop cover which reduces splash erosion

- **CROPS**
  - o Early planting
  - o Suitable crop management: Selecting the right crop for the area and use of companion crops can reduce the amount of erosion.
  - o Crop rotation
  - o Intercropping

Good Farm Planning and Crop Rotation

Figure 38:Suitable crop management: Selecting the right crop for the area and use of companion crops can reduce the amount of erosion	Figure 39: Example of Good Farm Planning and Crop Rotation

B) Mulching/Trash farming
- This is the use of dead plant residues as a cover over the ground.
    - Decrease impact of raindrop
    - slows down speed of runoff
    - Increase water infiltration
    - Encourage worms which barrow the soil to survive
    - reduce wind erosion
    - When it rots it adds to the soil plant nutrients

MULCHING
- ➢ Crop rotation
- ➢ Contour Farming
- ➢ Strip cropping
- ➢ Grass Strips
- ➢ Trash lines
- ➢ Unploughed Strips
- ➢ Sisal hedge
- ➢ Planting of Trees/Agroforestry

Physical Soil Conservation Measures

Selection and design of structures depend on:

Figure 40: Maize as soil cover

Maize residue as soil cover

- [ ] Climate and the need to retain or discharge runoff.
- [ ] Farm size and system (large or small scale, mechanized or non-mechanized)
- [ ] Cropping pattern (perennial or annual, with or without rotation)
- [ ] Slope steepness
- [ ] Soil characteristics (erodibility, texture, drainage, depth, stoniness and risk of mass movement)
- [ ] The availability of an outlet or waterway for safely discharging runoff from cropland.
- [ ] Labour availability and cost
- [ ] The availability of materials eg. stone
- [ ] The adequacy of existing agronomic or vegetative conservation measures

- **The common ones are:-**
- [ ] Cut off drain
- [ ] Terraces
- [ ] Retention ditches
- [ ] Artificial Waterway

Cut-off Drain (or storm water diversion drain)

- [ ] This ditch or drain intercepts and diverts the storm water or flood water or storm runoff which would otherwise flow down from higher ground on to arable land which it protects. It is the first line of defence

Figure 41: Cut Off Drain
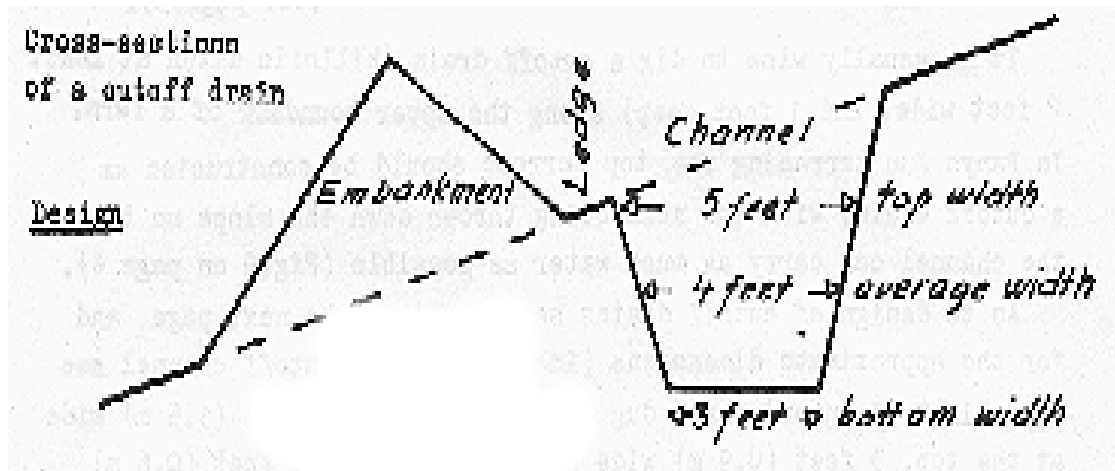
Dimension		Gradient I n	
		clay soil is	1%
Top width	1.5 m (5')	Normal	0.5%
		Silt/sand	0.25%
Middle width	1.2 m (4')	The C.O.D. is laid to drain into:	
			- Rocky area
Bottom width	0.9 m (3')		- Permanent pasture area
			- Natural waterway
Depth	0.6 m (2')		- Artificial waterway

Types of Terraces

Figure 42: Final stage of a Cut off Drain

Final stage of a Cut Off Drain	Terraces
• The embankment is planted with grass to offer stability. • Periodical maintenance by desilting is vital	❑ A terrace is a level piece of ground, cut on a slope or a ridge or a ditch controlling the flow of runoff down a slope.

Channel terraces:

- **Narrow base channel terrace** (Fanya chini)

Suitable for slopes 0-20%. Its 2'-3' wide and 0.5' to 1' deep. Soil thrown downhill.

- **Broad base channel terrace**

These are suitable for mechanized areas and are suitable on slope of between 0 to 10%

Broad base channel terrace

Bench Terraces

These are either excavated or developed

- **Developed Bench Terraces**
    - Unploughed strips
    - Grass strips
    - Stone line
    - Trash line
    - Fanya Juu

Figure 43:Grass Strip Terrace

Figure 44: Trash line Terrace

Figure 43: Stone Terrace

Figure 46: Maintenance of fanya Juu

Figure 45: FANYA JUU

-
-
-
- **Excavated Bench Terraces**
  These are practical in deep soils. They involve a lot of earth moving. They are labour intensive and fertile soil ends up being thrown on fertile top soil.

  A modification of bench terraces is the modified bench terraces**.**

Loess Plateau in CHINA (Excavated bench terraces)

- *Artificial Waterways*

This is a wide and shallow drainage channel needed to discharge water from a C.O.D where no other means is possible. It can be located on boundary of two farms. It is at least 1.5 m wide and 0.3 m deep.

Figure 47: Artificial Waterways

Soil conservation in grazing land

Erosion control in these areas can directly and precisely be equated to improved management.

Control Measures

❑ The simple most effective method is grazing control. The number of animals kept should be according to the carrying capacity of the land.

Rehabilitation of Grazing Land

Close the area from grazing and then plough along contour to increase water infiltration. The spacing of the plough furrows is to be 1 m. In completely denuded area and 3 m where there is grass and weeds.

5.4.2 SUSTAINABLE LAND MANAGEMENT

Name of Better Practice: Sustainable Land Management (SLM)
Better Practice Location: Mara River Basin
Background
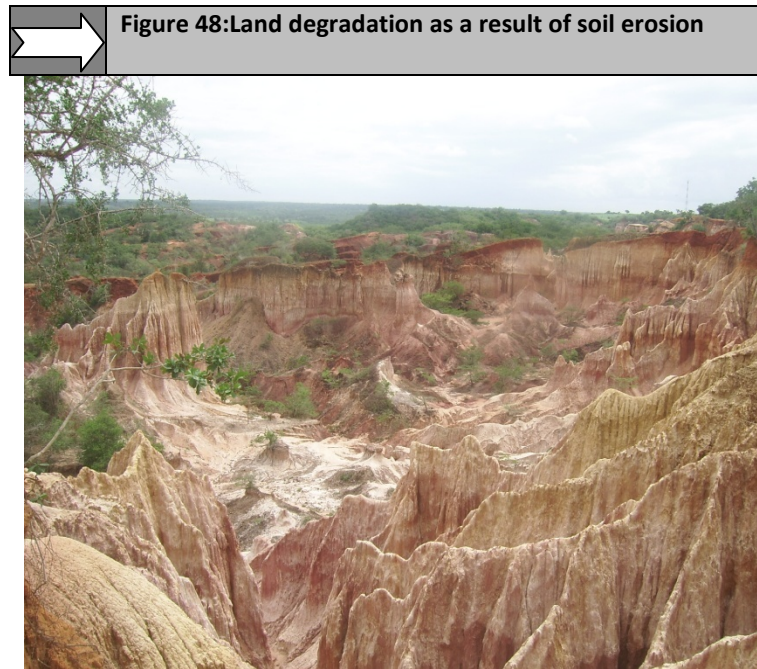
Figure 48:Land degradation as a result of soil erosion

The status of the problem in the sector, the challenge that proposed better practice seeks to resolve.

The percentage of forest cover has been declining. Soil erosion and increasing sediment loading in rivers is causing deterioration of water quality and loss of aesthetic and habitat value of the river. The eroded sediment deposits in the wetlands in the lower parts of the basin. This destabilizes the wetland ecosystem. In addition, water bodies are polluted with chemicals carried by runoff from agricultural land. The component of soil conservation, afforestation and sustainable water harvesting for domestic, industrial and agricultural use is vital for the conservation of the Mara River Basin

Indicators:
- Increased productivity and are profitable
- Cost efficient
- Easy to learn
- It is socially and culturally accepted
- Effectively adopted and taken up
- Environmentally friendly
- Appropriate for all stakeholders including socially marginalized groups

The Application

- Since there will be village sensitization *barazas* on PFM and Forest Act in these areas as well, Ministry of Agriculture will take advantage to tell the locals about soil and water conservation. *Lectures*: this will be given to youthful farmers
- *Field days*: these are organized meetings in a central location with all the new technologies on agro forestry and other natural resource conservation
- *Demonstrations*: these will be done mainly on-farm to practically showcase new technologies
- *Tours*: farmers will be involved in exchange visits to sites to learn best practices and exchange experience and challenges on conservation in forest adjacent farms

Results

Challenges

- Enforcement of conservation measures
- Use of chemical fertilizers
- Sloppy land
- Soil loss through erosion

Aim

- Conserve and use soil *in situ*
- Harvest and conserve water for agricultural production and domestic use
- Encourage tree growing in farms with emphasis on agro forestry

Lessons learnt/ Sustainability

- Creating enabling environment in institutional, policy and legal framework
- Ensure local participation combined with regional planning
- Build capacities by training people
- Monitoring and assessing SLM practices and other impacts
- Provide development support at local and regional level

Contact Information for the Best Practice

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5.4.3 LAND AND WATER MANAGEMENT INTERVENTIONS PROMOTED BY THE MRBMI

Table 2: Land and water management interventions promoted by the MRBMI (source: WWF Documentation of WWF's Mara River Basin Management Initiative)

Intervention	Rationale and stated link to WRM	Remarks/Success factors/Challenges
River Bank Protection	Stabilisation of the river bank and prevention of erosion	- Engaging the support of Government extension services was key to its success - Addressing problems through national and regional dialogue -Following lobbying by WWF and the Mara WRUA, LVBC has agreed to fund the construction of sewerage treatment works for Bomet Town, Kenya
Demonstration farms	-Prevention of soil erosion and nutrient run-off on steep slopes -Efficient use of on farm water sources -Improvement of crop yields	-demonstration farms to showcase good soil management. Contour farming, terraces and rotational farming, taking areas next to the riparian zone out of tillage to maintain continuous ground cover and reduce soil erosion. - These lessons and practices are shared through open days and trainings. -good economic incentives for farmers to invest in high value agro-forestry as a realistic alternative to annual cropping.
Spring protection	Prevention of contamination of water supplies	-Interventions range from fencing off the springs, to more transformative works such as putting in concrete steps, a discharge pipe or tap, and creating completely separate access points for livestock and human water consumption. Often trees are planted around the spring for beautification and to stabilise the soil -Spring protection works can provide a focus point for collaborative community action on water and deliver tangible benefits for improved and protected quality and flow of domestic supplies -27 springs have been improved in Kenya and 4 springs protected in Tanzania -Community testimonies have stated that access, availability and reliability of water supply has improved after protecting wells and springs. (Kuloba, 2011)
Rainwater harvesting / water storage	-Water conservation in water scarce areas -Improved community access to water particularly during dry season	

Tree Planting	-Increase vegetation cover in degraded / riparian areas - Income generation from high value crops	
Fuel Efficient Stoves – _jikos_	-Reduced demand for household fuel wood -Protection of vegetation / tree cover -Income generation for people trained to make stoves	
Dairy Goats	-Income generation and improved nutrition for low income households -Incentives for communities to grow perennial fodder crops to improve vegetation cover	
Commercial Tree Nursery	- Income generation for catchment management groups and WRUAs - Increased tree cover along riparian zones -Additional source of income for community from the high value trees	
Improving Waste Water Treatment systems for Hotels in the Maasai Mara	-To reduce the number of incidents of pollution from sewage and waste water in the Lower Mara	- constructed wetland good practice for waste management. The investment required to put in a constructed wetland can be high cost 5million KES($58,823) and there is no immediate financial return on this investment. -Hotels compete rather than cooperate with each other, so are wary to share practices -Little transparency in compliance with laws for discharging waste water into the river -Many of the camps are seasonal and temporary so it is hard to engage them and there is no incentive to invest in long term waste water management
Lobbying for protection of the Mau	-To reduce further deforestation of the Mau, support forest regeneration / sustainable forest	--Through lobbying and dialogue with the Government of Kenya, WWF has played an important role in raising the political profile and public attention to issues of encroachment in the Mau Forest

Forest Complex	management -Protection of river headwaters, springs	- WWF has been one of the NGOs actively involved in promoting the protection of the Mau and has signed a Memorandum of Understanding (MoU) with the Kenya Forest Service (KFS) to assist in the rehabilitation of the Trans-Mara Forest Reserve through successful establishment of Community Forest Associations (CFAs), and facilitating the development and implementation of Participatory Forest Management Plans -Three CFAs management plans ready:Nyangores,Amala and Olenguruone
		Politics and vested interests: Some land and water management problems are highly contested and complex, with root causes closely linked to powerful interests in both countries. This makes their handling highly sensitive and difficult to address in a direct way through a field based programme. Examples include the Mau forest where project staff received threats for intervening, some hoteliers operating in the Mara River Game Reserve in Kenya and mining operations in Tanzania.

5.5 PARTICIPATORY FOREST MANAGEMENT

5.5.1 PARTICIPATORY FOREST MANAGEMENT IN SOUTH NANDI FOREST

Name of Better Practice: Participatory Forest Management PFM

Location of Better Practice: Kobujoi, South Nandi District, Kenya

Introduction

Participatory Forest Management (PFM) is a general term describing community involvement in the management of forests. The purpose of PFM is to conserve, protect and sustainably use the biodiversity of MRB landscape and its intrinsic values. It seeks to improve and sustain forest health and vitality for biodiversity conservation and community livelihoods for posterity. Community Based Forest Management (CBFM) is one kind of PFM approach that takes place on village land, on forests that are owned or managed by the Village Council and leads to the establishment of Village Land Forest Reserves (VLFR), Community Forest Reserves (CFR) or Private Forest Reserves (PFR). Villagers may decide to set aside, or "reserve" a forest area for a range of reasons. In some cases it is because they have seen their forests declining through poor management or uncontrolled utilization. In other cases communities may wish to set aside a bare area for forest restoration. In other cases, villagers may wish to reserve their forest because it has significant cultural and economic potential and they wish to obtain tangible benefits from sustainable harvesting.

Figure 49: PFM ensures community involvement in the management of forests by conserving, protecting and sustainably using the biodiversity and its intrinsic values

Over the past years, the Serengeti Maasai Mara Ecosystem (SMME) has been faced by a myriad of constraints, problems and challenges, which pose a great threat to its sustainability. These include:

- over grazing

- soil erosion
- Illegal timber logging in the Mau forest reserve
- charcoal making
- Poaching of wildlife and trees like the Sandal wood and Cedar
- Increased demand for land for settlement resulting to excisions and illegal occupation
- Inadequate staffing hence leading to poor forest Rangers patrols
- Inadequate awareness on forest conservation
- Political interferences
- Poor coordination and collaboration within and among stakeholders
- Lack of cost benefit sharing mechanisms
- High poverty level in the surrounding forest areas

In the past, the government managed the forest reserves without incorporating other stakeholders and adjacent communities. However, emerging challenges dictate that they involve other stakeholders in management. There is a need to strengthen the capacity of the community and linkages between relevant institutions to effectively manage the resources. Recognition and understanding of the various interest groups that have a stake in this resource will go a long way in solidifying efforts and support needed for effective management of the ecosystem. There is therefore need for management plans to guide participatory management of forest resources in Kenya and Tanzania.

Implementation of the Better Practice

The forest management plan is developed in a participatory way taking into the consideration that the process is as important as the end product and also to conform to the provisions of the Forests Act (Kenya Forest Act 2005, Tanzania. The key steps for management planning are:

i. Awareness creation on Participatory Forest Management (PFM)
ii. Training community leaders, Civil societies and Government staff on PFM
iii. Formation of Community Forest Associations (CFAs); e.g Amala and Nyangores CFAs in Kenya and in Tanzania.
iv. Participatory Forest Resources Assessment (PFRA)/Baseline Studies (socio-economic, vegetation survey, flora and fauna inventory) carried out: to measure and assess the forest resource, its use and potential and; to analyze and present this information in a clear and simple way.
v. Biodiversity surveys; covering birds, reptiles amphibians and the general flora and fauna
vi. Feasibility studies and business plans in apiculture, ecotourism, farm forestry/on-farm tree planting, botanical gardens and herbal medicine
vii. Conducting Visioning and planning workshop involving major stakeholders

viii. Undertake Forest Zonation to help with planning process
ix. Forming Local planning team for collecting additional information for the plan
x. Forest management formulation team heavily consults other stakeholders and technical specialists in drafting the plan
xi. Presentation of the draft to CFA members and other consultative forums.

Box 9: Practical Case study of Implementing PFM for South Nandi Forest

Practical Case study of Implementing PFM for South Nandi Forest:

- Organize sensitization village meetings (barazas) to raise awareness on co-management of the forest. Identify and define the roles and responsibilities of various user groups e.g. Grazers, Firewood e.t.c
- Conduct an election of community representatives to form a Community Forest Association (CFA) from various locations and include representatives of each identified user group
- Register the CFA thus will have developed Bylaws and constitution
- Promote environmental education and awareness in clubs in learning institutions
- Involve the community and stakeholders to participate in national environmental days.
- Conduct environmental education and awareness campaigns through media, brochures, posters, road shows and drama.
- Develop management agreements between community and KFS
- Develop innovative methods for enhancing community benefits
- Introduce nature based enterprises
- Carry out organization capacity assessment for the CFA
- Identify capacity building needs and train to address needs e.g. Financial management and record keeping skills, transparency and accountability
- Conduct exchange programmes for community to learn from experiences of others
- Zonation: Identify the zones in the forest i.e. plantation areas, natural forest (Total protection and conservation areas, grass glades, areas for subsistence uses, illegal settlement areas and intervention zones. The parameters for zoning would assist in identification and management of forested areas, grazing, touristic, settlement, water points and degraded forest areas among other critical habitats.
- Develop strategic plan for each CFA
- CFAs to enforce their rules and regulations
- Enhance awareness of the Forests Act and other relevant laws.
- Develop a good management structure.
- Promote advocacy programme within CFA
- Promote community participation in forest conservation and protection: Involve the community (example scouts) in joint patrols, forest fire protection and tree planting
- Develop forums for community participation in networks and meetings
- Monitor and evaluate the pilot NBEs for impact and sustainability
  Replicate in other areas

The resultant PFM management plan arms CFA members with requisite information to make decisions about sustainable forest management and utilisation that maximizes benefits to local people and develop a management plan that is based on good forest management practices. The inventories contained assist to monitor the health of the forest as utilisation takes place.

Monitoring and evaluation during the implementation phase will is done periodically to ensure that activities are within the plan and for proposing necessary adjustments. Detailed annual work plans are prepared on the basis of the management plan in consultation with the identified stakeholders.

Table 3: Management interventions for forest extension services

Strategy	ACTIVITIES	RESPONSIBILITY
Promote on- farm tree planting	• Mobilize the FACs • Create awareness on desirable tree species for specific uses • Train on tree nursery establishment and woodlot management • Establish tree nurseries • Marketing of on-farm products. • Training on seed collection and processing • Plant trees on farm	**KFS, CFAs,** **Local authority, NGOs, Private organizations**
Promotion of efficient forest resource utilization technologies	• Promote use of energy saving devices • Promote efficient charcoal conversion methods on farmlands • Promote efficient harvesting and processing. • Provide links to markets	**NGOs, CFA, Private organization,** **KFS,** **Mau Forest Adjacent Communities**
Integrate forest extension with rural development strategies	• Tap CDF, LATF funds in on-farm tree planting • Tap youth funds in carrying out tree planting • Promote other environmentally friendly development activities	**Communities , Local leaders, KFS**

Results of the Practice

Some of the results realized as a result of applying the better practice are:

- Development and implementation of Participatory Forest Management plans
- Community Forest Associations have been institutionalized,
- Memorandum of understanding between with government agency(i.e. KFS) and the local communities(i.e CFAs) on management of forests and non- monetary benefit sharing,
- Undertook inventory of biodiversity within the forest i.e. Birds checklists, Plants, Herpetofauna and developed Forest Resources map.
- Formed Chesumei Cooperatives as the CFA arm for doing business and now markets nature-based enterprises products and other forest produce. Part of Income is invested in Community Revolving Funds.
- The cooperative has developed partnership with the private sector through Nature Kenya facilitation as marketing outlets for their produce. e.g. George William son Tea company and sold them 50.3m^3 of wood for Ksh 95,760(USD$1,167). Other private sectors outlets are for Energy saving technologies, Bee Keeping products, Farm forestry, Ecotourism and Herbal medicine.
- Conducted Trainer of Trainers (TOTS) to reach out to more local communities as the TOTs were facilitated to train down what they had been trained on. This provided who help in continuation and induced sustainability of PFM project.

PFM outcomes in South Nandi

- **Women empowerment and self confidence** among communities who participated in the project. Some have become TOTs invited within East Africa region by other development partners.
- **Innovative incentive mechanisms** (PELIS, Carbon Credits, employment of youth, IGAs) developed,
- **Reliable Community Forest Scouts** who patrol on their own and sometimes with Forest rangers. The scouts have managed to contain illegal activities in the forest by the surrounding communities as well from forest rangers who collude with those who carry illegal activities in the forest.
- Conducted **Research and studies** that has generated a lot of information in the **resource center.** The project organized informative public meetings to disseminate research findings i.e. Synthesize findings for use for public education and within learning institutions, Publications on findings in journals and through popular media (brochures, leaflets, posters, radio and TV programmes, newsletters); Electronic posting of results on websites of relevant institutions to circulate the 'Success stories'.
- **Successful advocacy by CFAs** and other partners to stop government from construction of multi-purpose hydroelectric dam inside the forest in 2010.

- Increased tree cover of the forest by planting 419,625 seedlings (on farm land) and 319,000 (forest rehabilitation).The project cumulative income from on farm trees at the age of 15 years is KShs1,762,428,000($21,234,072) while Cyprus is KShs 440,610,000($5,308,554)(source: Nature Kenya End of project report,2012)

Challenges
Some of the challenges faced in implementing PFM in South Nandi Forest:

- Negative attitude on PFM among players who were not trained in PFM. They even sabotaged the process especially government officials who are required to carry out specific statutory responsibilities in PFM implementation.
- Low funding levels to the forest sector due to inadequate valuation of forest contribution to the economy
- Political interference
- Language barrier among the implementing facilitators, in this case Nature Kenya staff were from outside South Nandi community.
- Group dynamics in the formed CFAs and demands to play at the same level as other key forest stakeholders.
- Gender - Male chauvinism among the communities hence reluctance to fully integrate women in the PFM despite the new approach.
- Cultural factors (initiation, gear and dress/traditional attire) this affected the calendar of PFM activities. During initiation the facilitators should avoid planning training session and high women participation is during holidays when women have their children to step in for them.

Challenges anticipated and counter strategies for replicating PFM in Mara River Basin
- Political interference (Through administrative boundaries that espouse the entire county) CDF
- Group dynamics (Conduct Leadership and management training to contain the negative impacts of the groups)
- Gender issues (Mainstreaming gender in PFM interventions)
- Cross cutting issues (HIV/AIDS, Dropouts, vulnerability project management) by alternative income to improve livelihoods
- Financial Allowances in meetings (Handouts); start with sustainability in mind and activities that are geared towards long term.
- Over dependence on forest products (diversification and promoting forest conservation activities that respond to their livelihoods needs).
- Unpredictable climate changes
- Pests and diseases
- High competition from other players especially those in the private sector

- Human wildlife conflict

6. Sustainability and Reliability
- Training TOTs and provision of initial support
- Registration of institutions such as CFAs and Cooperative
- Embedding alternative means of livelihood IGAs in the PFM so that local communities can have short term benefits from their participation in conservation activities.
- Establishment of a Resource center (to store generated project information and well as other relevant information from elsewhere. This will be learning site for surrounding schools.
- Capacity building leaders on Advocacy (Dam issue)
- Embedding Environmental Education and targeting the schools around the Forest.
- Community Forest Scouts as part of forest monitoring team.

7. Lessons learned
- Capacity building the foresters in PFM
- Involvement of all key stakeholders in PFM (Private sector assist in key roles) e.g. Seedling donation, transport
- 'Not every woman represents interests of women'
- Map out and use opinion leaders to influence programmes being implemented by noting their concerns through spending time with them so as they fully understand the process.

Conclusion

The ultimate success of a PFM lies in its implementation process that must truly involve stakeholders and local communities, training in PFM and adopting a new mindset (PFM friendly mindset), development of the plan and studious implementation of the plan. Resource for implementation of the plan remain challenge hence consideration should be given to all beneficiaries of the forest resources/ecosystem services paying for the benefits both locally and externally including global community (e.g. some tax mechanism).

Suitable channels for dissemination this information
- Workshops
- Exchange trips
- Films
- Brochures/Posters
- Barazas

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5.5.2 GOOD PRACTICE: AGROFORESTRY/HIGH VALUE TREES FOR BETTER LAND AND WATER MANAGEMENT

INTRODUCTION: What is Agro forestry?

A collective name for all land-use systems and practices in which woody perennials (trees and shrubs) are grown/managed on the same land management unit as crops and/or animals. This integration of trees and shrubs in the land use system can either be a spatial arrangement e.g. trees growing in a field at the same time as the crop, or in a time sequence e.g. shrubs grown on a fallow for restoration of soil fertility. The close association between the components has both ecological and economic advantages.

The trees in an agroforestry system are not necessarily planted. Instead, natural regeneration of trees may be protected or mature trees may be deliberately left in the fields or in pasture. Traditional and innovative agroforestry technologies hold considerable promise for alleviating three critical problems facing resource regions - rural poverty, natural resource conservation and sustainable development.

Figure 50: Pasture-Tree-Cultivation complex

Figure 51: Maize field with trees

AGROFORESTRY SYSTEMS IN HIGH POPULATION DENSITIES

Agro forestry Systems
Agro-pastoralism: combination of herbaceous crops and extensive livestock production (combined).
Agro-silviculture: herbaceous crops and trees or shrubs (combined).

Agro-silvipastoralism: trees or shrubs, herbaceous crops and livestock production (combined).

Why Agro forestry?
1. Natural and gazetted government forests are shrinking. The population and demand for tree products are increasing and natural forests are being cleared at a high rate.
2. Conventional forestry caters mainly for industrial purposes.
3. The beneficial role of trees in tropical land use systems is increasingly being recognized.
4. The small land sizes owned by many rural farmers have to be used for crop growing and settlement.
5. There is a realization that agro forestry products can generate the much needed cash incomes on the farms
6. There is need for product substitution

The role of agro forestry

In terms of land sustainability, Agroforestry is seen as one of the several approaches for improving land use in any given situation. Yet the breath and variety of Agroforestry systems and practices imply that Agroforestry offers at least partial solutions to many rural land use and production systems. The promise of nitrogen fixing trees for improving soil fertility on crop land and pastures has been widely discussed as has been the resistance of some trees to drought. The role of wind-breaks in protecting crop land and pasture, the contribution of high protein tree fodder to livestock production and commercial potential of several kinds of tree crop are positive effects.

Sites where agro forestry can be practised

An array of sites exists where Agro forestry can be practiced. Sitting is crucial especially in areas where land is limited and where the tree component might complete with crops. It is good to have a farm map drawn together with the farmer and use it for discussion as to where the trees can be planted. Some of these niches/sites include: around homesteads, along fences, farm boundaries, on crop lands, woodlots, degraded areas, streams/ river banks, pasture/grazing lands, soil conservation structures, hilltops, along paths and water logged areas.

Locality

Each of these three systems has its special characteristics, advantages and areas where it could secondly be applied and adopted. This has to do with land availability, land potential, land farming system and market outlets for both agriculture and forestry products.

Utilization of agroforestry trees

Agroforestry trees produce a variety of products and services that are beneficial to a farmer in different ways. Functions of trees in farmer's land-use system are listed below.

Tree products

Food, fruit, fodder and forage, charcoal for construction (e.g. timber, posts, poles, and other fencing materials) medicines, raw material for household utensils and other cottage industry (e.g. utensils handcraft, tools, fibres, honey) and cash from sale of the same products.

Service for other production factors

Soil fertility improvement, soil erosion Control, water conservation/improved water infiltration and retention, stream/river bank stabilization, water purification, improved drainage in water logged soil, environmental conservation, weed control, farm protection, wind break recreation and shade, ornamental and cultural value, ritual and social functions.

Constraints to agro forestry extension

1. Inadequate knowledge among extension staff on current agro forestry practices
2. Inadequate germplasm
3. Pest and diseases
4. Inadequate moisture
5. Hard pans
6. Traditions and taboos
7. Inhibitive institutional and policy issues.

Introducing agro forestry practices in an area

Following are some relevant issues to consider when introducing AF in an area.

1. There is need to build an understanding of the community's needs and perception.
2. Tap indigenous technical knowledge in propagation, management and utilization (build up upon the knowledge
3. Understand farmer preference of trees
4. Identify an appropriate mixture of indigenous and exotic species
5. Balance between environmental and economic impacts
6. Train farmers for transformation (capacity building)
7. Elaborate the service role of trees to other enterprises
8. Link agro forestry to issues of food and wood security and income generation

Ideal agro forestry species

Trees occupy a cultural position in all categories of Agro forestry. Woody component (trees and shrubs) are important to the system in bringing about environmental stability and sustainability when grown and managed in association with crops and/or livestock production

1. Be multipurpose
2. Fast growing
3. Deep rooted non competitive with crops
4. Easy to coppice
5. Nutritious and palatable
6. Nitrogen fixing
7. Have high canopy

Functional relationships of trees, crops, livestock:

Benefits of crops from trees

> ➢ Trees add nutrients :- Nitrogen fixation, green manure , root decomposition
> ➢ Water retention: - Soil organic matter, wind breaks, shade.
> ➢ Soil conservation: - roots hold soil together, leaf litter on soil surface, less soil carried off, reduce wind speed, reduce soil erosion.
> ➢ Weed reduction: by shade,

Benefits to trees

> ❖ They are fenced and protected from livestock and wild animals (High survival rates through good management),
> ❖ weeding,
> ❖ fertilizer use,
> ❖ wind breaks and nurse crops for tree seedlings

Benefits to livestock

Supply of nutritious protein rich fodder e.g. Calliandra. Trees for this purpose should be: fast growing, resistant to drought, sprout profusely; palatable seed should germinate after going through digestive system.

Provision through: - cut and carry.
Letting livestock graze after harvest
Livestock benefit from shade
Weeds and shrubs wildings are controlled by browse and manure from livestock helps increase soil fertility (Source: LVBC 2011 INRM Training Workshop)

5.6 COMMUNITY PARTICIPATION IN INRM

5.6.1 CAPACITY BUILDING COMMUNITY BASED ORGANIZATIONS TO MANAGE NATURAL RESOURCES USING OCTAGON TOOL

Name of better Practice: OCTAGON TOOL:

CAPACITY BUILDING COMMUNITY BASED ORGANIZATIONS TO MANAGE NATURAL RESOURCES USING OCTAGON TOOL
Location of Better Practice: VI project implementation areas Musoma (Tanzania), Kisumu and Kitale (Kenya)

Octagon is tool that is used to assess the capacities existing organizations. It determines areas within which an organization is performing efficiently and effectively and at the same time points out areas that requires improvement to turn around a group's performance.

Introduction

Organization development is a complex component that enables a group to go through a complex of dynamics to attain maturity in terms of function and service delivery. Many member based organizations face many challenges. These challenges result in group failure to offer quality service, corruption, lack of focus and final collapse of the group.

Thus, a number of member based organization in parts of North Rift and Bungoma County have been facing such challenges for some time. There was lack of vision among the leaders and the members, poor leadership, poor financial management among others. This has resulted in failure in effective service delivery. These groups are mainly farmer based organizations that were formed in the counties of Trans Nzoia, Bungoma, parts of Marakwet, parts of Pokot and parts of Lugari. Farmers have not had a chance to diagnose their groups to determine the state of the health of the groups.

Many groups have crumbled after their erupted wrangles in the groups that are sometimes a result of conflict of interest among the members and the leadership and also poor decision making. Lack of transparency is also a factor that contributes to failure in group's performance. Information is often withdrawn from the members who at the same time have a right to this information.

An assessment was conducted in the said areas to determine the health of these groups and propose possible interventions. Organization assessment using octagon tool was adopted to investigate the health status of the groups upon which proposal for improvement through capacity building was to be drawn. This was a pre-requisite for consideration for any support.

Each aspect is reviewed at 2 levels as shown in the figure below. The two levels (variables) are then assessed by looking at two statements.
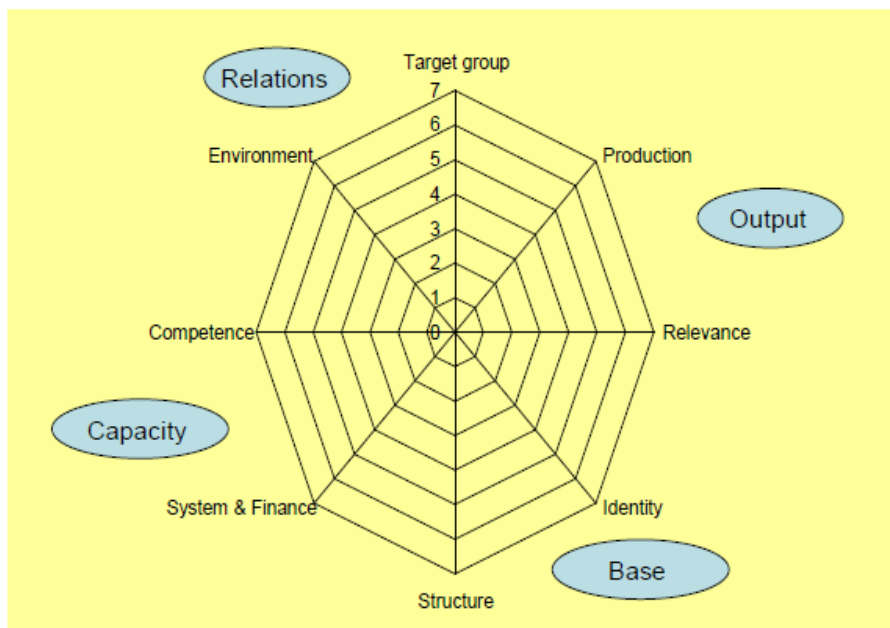

Figure 52: Octagon tool, source SCC-Vi Agroforestry Project, Kitale, M&E Unit

Implementation of the Practice

The process for determining the health status of the groups was to the groups through

- Identification of potential groups for assessment – groups that are considered to be having potential for growth were selected and prepared for the assessment
- Administrations of assessment questionnaire – the selected groups were assessed involving interviews with selected group members. Interview questions were mainly on leadership, group management, project management, target, working environment, finance and administration and group capacity.
- The results of the interview are analyzed and a report of the same prepared on performance on each sector.

- Feed backing – the results of the analysis are given to the groups through a plenary session where all the members are involved in an open discussion with the assessment team. A way forward is then developed and key action points determined upon which the group will work on especially areas that pertinent and require improvement (based on the 8 components)
- Capacity building – trainings are organized by the group to improve the weak areas as deduced by the octagon assessment.
- Implementation – the member based group is then engaged in development activities for some time.

Reassessment – after one year of operation, a similar octagon assessment is done to the group to compare that changes made and improvement made. The results of this

- Assessments are compared with the initial assessment to track progress.

Octagon assessment tool developed in Sweden was adopted by VI Agroforestry since the year 2006 and has been ongoing. Selected groups were identified in the aforementioned zones and counties.

Octagon assessment was facilitated by VI Agroforestry in collaboration with Ministry of Culture and Social Services. Member based organizations were also key in determining the right candidates to be assessed.

Octagon assessment tool was designed to enable groups to undertake self-assessment. However, another organization can facilitate the assessment in a collaborative manner with line service providers. The cost is low compared to the other forms of assessment.

Results of the Practice – Outputs and Outcomes
Following successful assessment of the groups, there has been significant improvement in group's performance and members understanding of their roles. It is on this backdrop that nine (9) farmer

organizations were considered for financial support. The groups were to carry out activities on environment and natural resource management in their areas involving all the members. The benefit of the projects undertaken benefits all the members.

Success of the approach has been assessed and a report on the same prepared. It shows that this tool is suitable to be used as a baseline for any member based organization. There has been significant improvement in the performance of their performance and how the leadership relates with the executive has been enhanced.

Lessons Learnt

Following the implementation of the octagon assessment process:

-Some groups have grown in membership and there is improved performance, responsibility and change of attitude on ownership of organization. This follows increased awareness on the group vision. This was facilitated by capacity building efforts enhanced by the group to improve the weak areas. Factors contributing to dismal performance are addressed in a systematic manner to yield better results.

- When organisations are guided to their weaknesses and they develop actions and are supported to implement these, changes take place fast and the group grows unlike if the change process is unstructured. OCTAGON tool is a structured and systematic way of managing change in community groups involved in natural resources management.

- Other tools that have been used with success include Organisational Capacity Assessment Toolkit (OCAT).

Conclusion

- Octagon assessment has contributed immensely to a rise groups membership and vertical growth of the groups. Members to these groups have benefited from improved services offered to them by the organization. There is a higher level of accountability of the leadership to its members since the later understand their right to information.

Octagon as a tool for organization assessment is a good practice worth emulating since it has contributed immensely to the improved function, service delivery, transparency, participation by organization members. This contributes a lot to the sustainability of the organizations especially so farmer organizations and those managing natural resources.

An organization seeking to adopt the tool for assessment is cognizant of the fact that the tool is one of the best to determining the baseline status of an organization they intend to engage. It is better to know the strengths and weaknesses of an organization with which a partnership is to be entered. This tool is suitable for such assessment and informs both parties on what to be careful of the potential areas of weakness of the organization they intent to engage in a partnership.

Suitable channels for disseminating the OCTAGON tool

- Organized community groups e.g. farmers

- Farmer's networks.
- Specialized training centres e.g. Agro forestry training centre in Musoma and Kitale
- Exposure tours to CBO that are success stories and those not doing so well to compare the ingredient of success.

Further Reading

-
i. Annual projects Report, VI Agroforestry
ii. Octagon Manual for Civil Society Organizations Assessment, SCC-Vi Agroforestry

MARA WATER USERS ASSOCIATION

5.6.2 COMMUNITY CONSERVATION BANKS

Name of Better Practice: Community Conservation Banks
This is practice of community economic empowerment through environmental friendly initiatives.

Location of the Better Practice: Initially developed in Musoma, Tanzania then replicated in Kenya Nandi hills, Uganda Masaka and now other programmes have adapted it to suit their situation
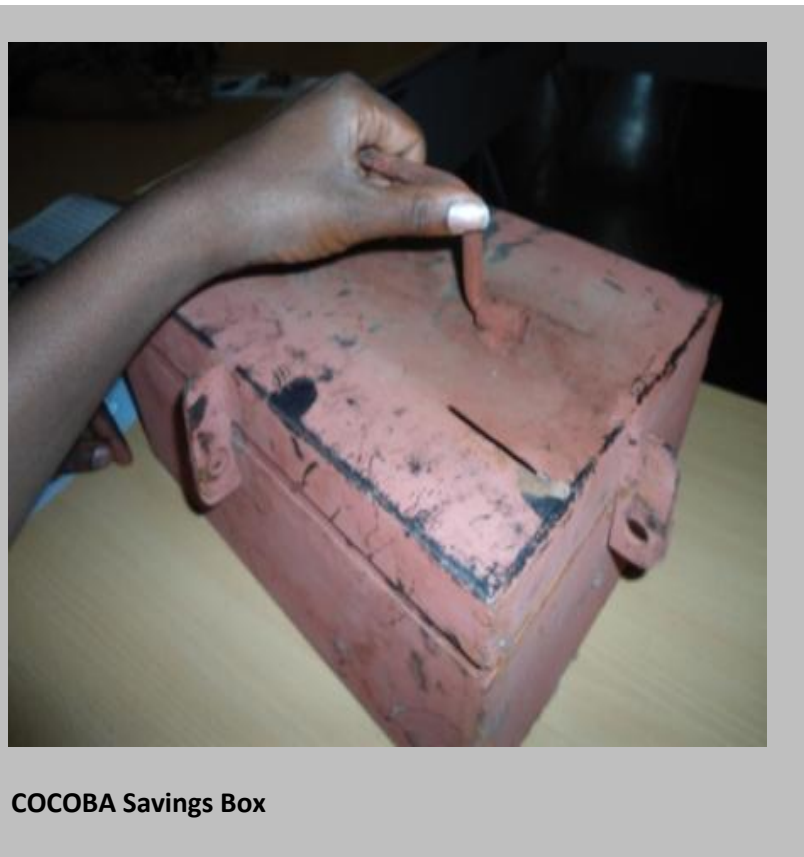
COCOBA Savings Box

Introduction
COCOBA are the community conservation banks established by the support from FZS to facilitate communities with financial assistance in fighting against poverty alleviation. The introduction of COCOBA was inscribed after the realizations that people who are jobless do engage in illegal activities including wildlife poaching within the SMME. The reasons for peoples participating in illegal activities among other are lack of capital for entrepreneurship and idleness of people in villages. In order to address these problems and improve livelihood of the people while maintaining natural resource conservation, the COCOBAs were established as a measure to improve environmental conservation within SMME while promoting community's livelihoods. The members of the COCOBA are binded by the constitution that has provisions which prohibit members from engaging in charcoal making and poaching of wildlife.

Implementation of the Practice
The COCOBA have started with some seed money from Frankfurt Zoological Society(FZS). The FZS facilitated the COCOBA through training on entrepreneurship and financial management. The highest

number of members per one COCOBA should not exceed 30 people and there may exist as many COCOBA as possible in one village. The source of funds for the bank is through contribution and saving from members in the form of shares. Every COCOBA has its own constitution, leadership of which they have to abide and operate. The members are allowed to take loans from the COCOBA to start any businesses that are environmental friendly- what are the main activities carried out?

The members of the COCOBA are discouraged from involving in livestock farming as they do degrade the environment. They are encouraged to undertake poultry farming and bee-keeping in their areas of jurisdiction. The members are strictly prohibited from charcoal making and if involved on charcoal industry as well as wildlife poaching, the member in question is evicted from the COCOBA.

Outputs and Outcomes
- Improved income to peoples with improvement on the living standards
- Reduced poaching intensity as people are engaged in alternative livelihood activities.
- Improved environmental conservation as the constitution prohibits members from involving into charcoal making and wildlife poaching.
- Change in attitudes of the communities

Success Factors & Lessons Learnt

- Communities do stop illegal activities if a tangible benefits are accrued from the investments
- Support and provision of alternative livelihoods to communities adjacent protected areas does reduce poaching intensity and help to conserve the environment.
- People are keen to participate on environmental conservation activities directly and indirectly if they **receive tangible benefits**.

Effective Channels for dissemination this practice

- The practice can be disseminated through study tours
- Awareness creation and education
- Workshops and seminars
- Publications
- Development of promotional materials such as leaflets and brochures
- Media such as Television and Radio broadcasting

Contact address for the better practice
Serengeti Ecosystem Management Programme C/O Frankfurt Zoological Society
P.O Box 14935
Arusha, Tanzania
Phone: +255(0)786159141
Website: www.fzs.org

5.6.3 EDUCATION FOR SUSTAINANBLE DEVELOPMENT
Title of better Practice: Whole school Approach of   Education for Sustainable Development
Location: Lake Victoria Catchment in Kenya

Introduction:
Education for Sustainable Development (ESD) as a strategy toward sustainable environmental management and improved livelihoods for the people. ESD key elements and focus that work together are: Environment, Society and Economy. The programme targets pupils, teachers, education administrators, curriculum developers, private sectors and riparian communities. It ensures that projects portray how economic, social and environmental factors work together for sustainable development and how improved coordination of these activities would achieve possible synergies and optimum use of available resources.

LVCEEP is engaging Nature Uganda and Wildlife Clubs of Kenya in the implementation of the project. At the national level the project has, the project has a core-team network to spearhead EE/ESD trainings in schools and the regional level. A regional Advisory Committee which comprises of stakeholders from government and NGO sectors.

Application
"Whole school approach" in which activities and training are tailored to target all learners, educators and the entire school community.
Formal education:
-building capacity of teachers and teacher trainers to deliver ESD as an integral part of their normal education activities.
-School children understand the rationale of conserving freshwater ecosystems and other natural resources and linkage between natural resources management and sustainable livelihoods
-National and regionally are decision makers sufficiently supporting education for sustainable development through curriculum and other policy documents, supporting your pre-and –in service teacher training and giving clear signals of the importance f learning for sustainable development.

Non Formal Education
-Riparian communities achieve capacity to conserve and sustainably manage natural resources and improve livelihoods within selected sites of the Lake Victoria catchment and best practices spread in wider areas.

Figure 53: Talking compounds of school implementing ESD

Material development to support formal, non-formal environmental education and awareness initiatives developed and disseminated.

Networking

Practical partnership building for ESD delivery with and among key stakeholders.

Involving the school wildlife club patrons is critical in successful implementation of environmental education. This should include motivating through exchange visits to other areas where they share

experiences with other patrons there and are able to see what other schools are involved in. This then followed by convening quarterly Patrons meeting whose objectives are to:

- Enhance contacts between the patrons, and other stakeholders which will strengthen work relations
- Elect an interim committee to steer Environmental Education within the surrounding locations and develop its terms of reference.
- To identify common activities for clubs
- To draw a yearly programme for Environmental Education in schools
- Identification of Common activities for schools/clubs
- Draw a yearly programme of activities for clubs e.g.

a) Tree nursery Establishment and management trainings
b) Conservation talks done with the help of other sectors to address cross cutting themes e.g. HIV/AIDS, Drug use and abuse, Gender empowerment, climate change, pollution, soil erosion

c) Showing conservation/Wildlife films with WCK western office

Conservation Education within the Community

- Conduct joint meetings or by integrating environmental talks and activities in other departments on advocacy to enhance sustainable natural resource management and governance by inculcating conservation attitudes to the youth and strengthening advocacy skills, leadership.
- Hold 1 schools environmental club patrons meeting to prepare education materials and agree on joint school environmental activities.
- Establish a resource centre.
- To aid in scaling up the students' academic performance through up-scaling specific topics on their curriculum.
- Print education materials.
- Support primary and secondary schools environmental open days.

Results

Formation of a network for Environmental Education initiative in schools and the community that undertakes the following.
- Membership services into projects and programmes
- Community conservation days
- Schools symposiums and environmental rallies
- National quiz for schools on conservation
- International Environmental days – Which when hosted can have environmental activities such as tree planting
- Schools/Colleges Art and Essay competitions
- Mobile Education units
- Sustainable projects in schools

Impact and outcomes

- Rehabilitation of schools environment. Beautification of school compounds through planting different types of trees, grass and flowers as well as designating pathways in school compounds. Grass helped in reducing soil erosion. Grass cover and gravel in pavements have improved overall cleanliness of pupils by reducing the amount of dust and mud in the school compounds.

- Trees now provide shade for relaxation and act as windbreaks protecting buildings and roofs from being destroyed by strong winds.

- The schools compounds are now being used as teaching and learning resources, geometrically shaped flower beds and gardens are used to teach geometry. Biological and ecologically functions of nature are also taught outside the classroom.

- ESD schools have become demonstration centres for other schools and communities

- Good Governance practices have been enhanced in ESD practiced schools

- Academic performance has been enhanced(children transiting to secondary schools attributed to incorporating ESD in school system and enhanced food security)

- Food security has improved in ESD schools

- Schools have realized improved income

- The pupils have realized some degree of self reliance

Figure 54: Kamimei primary school compound before the environmental education project

Figure 55: Kamimei few days soon after greening the compound

Figure 56: The compound after the success environmental education project May 2012

Figure 57: School children learn how to establish a tree nursery from their patron at Kitapkoi Primary school in Nandi

Box 1: Success Story on Environment Conservation and lesson Learnt in Kamimei Primary School

The head teacher of Kamimei primary Mr. Musa Ayiego shared with ERT that pupils feel happy when they go for bird watching. This is yet another effect of environmental education to appreciate the resources of Nandi Forest as source of happiness which modern lifestyle people spend lots of resources to get to environments that can provide them with happiness. The pupils' attitude has also changed. They don't destroy the fence as they did before; they have become more responsible as their perception on resources and need to take care of them has been instilled by environmental conservation. When they see a pupil going inside the forest, they make comments like "*wewe unaenda kuharibu msitu wetu*" (meaning you are going to destroy our forest). When the pupils see Nature Kenya staff, they call her Environment. The school tree nursery was established after starting the programme. Seedlings have been given to pupils to plant in their homes and for every seedling taken they replace by planting more in school. The school has sold some seedlings to KFS and put the money in the wildlife club account. The 22 Teachers also received 5 seedlings each of Elgon Teak. When other head teachers come and see our school green from what it was before, they feel envious while we are very proud because they ask for our assistance to make their schools green like ours. We have just given Mugen school seedlings to green their school too. The project should consider extending for five (5)additional years to deepen environmental education, have induction for head teachers and patrons especially the one who have not started and give them exposure visit to a school like ours. The project should support their start ups with publications, trainings and exposure tours. Our school is very proud of Nature Kenya and DFID for what they have done. They have made us stand tall among my peers who have seen total transformation of our school from being a muddy school to a **model green school in South Nandi**. Our schools enrollment is very high (1100pupils in 2012) despite opening of a new school in the neighborhood as parents prefer our schools as the local community have high regard for it.

Source: Improving Livelihoods Through Sustainable Governement, NGO, Private Partnership In South Nandi, Western Kenya
End-Review Report   May 2012

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5.7 INRM BEST PRACTICES COMPENDIUM

This emerging good practice guidein INRM has assembled other relevant documentations that MRB stakeholders will need to consult as they engage in improving the practices. The following table lists these and summaries of these best practices that have been provided in this guide to help the reader choose which one is appropriate in his/her context.

Table 4: INRM BEST PRACTICES COMPENDIUM

Title	Source	Remarks
EMERGING BEST PRACTICES FOR SUSTAINABLE RIVER BASIN MANAGEMENT FROM TRANSBOUNDARY MARA OF	**Softcopy/CD**	This documentation captures WWF and its strategic partners' experiences in implementing integrated water resources management (INRM) in the transboundary

KENYA AND TANZANIA **Documentation of the Mara River Basin Management Initiative, 2003-2012** **WWF Eastern and Southern Africa Regional Programme office(ESARPO)**		MRB of Tanzania and Kenya. It captures management challenges facing MRB. Local level institutions WRUAs and WAUs with subcatchment plans, Formation of Coordinating bodies-Technical Advisory Committees (TAC)(Kenya) and District Facilitation Teams(DFT)(Tanzania). Interventions to improve land and water management practices, integration and transboundary cooperation and monitoring INRM
Lake Victoria Regional Environmental and Sustainable Agricultural Productivity Programme (RESAPP)Cases studies 2009-2011 SCC-Vi Agroforestry Programme , February 2012	**Softcopy/CD**	VI Agrofrorestry captures different cases that farmers have use the Agroforestry practices to improve their lives and their environment. Some of the trees documented are *Moringa,Caliaandra,Sesbania,Desmodium,Teophrosia*,.Other cases discussed involves dairy goat farming, tree nursery establishment and management, village savings and loaning Association. The farmers discuss what they have done to success as well as the challenges faced and how they overcame them.
Best Practices and Knowledge Sharing in Watershed Management in the Lower Mekong Basin: Lessons, Prospects and a Way Forward. Consultancy Report: Cor Veer MRC-GTZ Cooperation Programme Agriculture, Irrigation and Forestry Programme Watershed Management Project (WSMP), Bangkok, December 2004	**Softcopy/CD**	The collection and dissemination of best practices in watershed management are proposed as an important strategy in the MRC WSMC: experiences with watershed management approaches are to be documented and shared, best practices for guidelines and policies to be identified and shared, priority issues and ways to deal with those, to be shared regionally and to form the basis for regional capacity building. All of this supported by a range of activities in information and knowledge management.

Sustainability Best Practices Guidelines for Rural Water Services Published by, Department of Water Affairs and Forestry Directorate: Information Programmes	**Softcopy/CD**	This document is written primarily for Water Services Authorities, Water Services Providers and communities to ensure best practices with respect to rural water supplies and sanitation schemes in South Africa.

6.0 IMPLEMENTATION ISSUES WITHIN MRB

The eruption of best practice approaches in the business, public and development sector, must be understood as one aspect of a wider process of change and/or 'organizational learning' (Allen, 1998, HBR, 2001). In the business sector, market forces drive this change process, in the public sector changes in the role and nature of government and governance.

The uptake of the emerging good practices in INRM should be seen within the broader context of managing change. This requires understanding both the technical and human aspects of the better practices as well as the context under the good practices will apply. MRB key characters referred in table 1. presents a menu upon which the cases studies and emerging good practices documented here will be replicated. The following are key consideration for implementation of the practices.

a. That emerging practices and lessons learnt will have to be replicated within the context of **ongoing programs and projects**. For, instance in watershed management projects and programme the implementer will need to ask: The question, **what can we do differently?** What has been done differently with greater success? What are the logical steps and how does it fit in our own situation? Thereafter, when a decision is made there is need for high level of commitment to make it work by all levels of leadership in the organization. A lot of otherwise good practices fail to achieve their potential due to poor project and program leadership. Organizations try to manage the change process through a repertoire of planning and action processes.

Table 5: Summary of Channels for disseminating Best practices:

- Exposure Tours
- Farmers networks.
- Farmers field school on different practices e.g.
- Agro forestry training centre.
- Agriculture show organized every year in collaboration with Regional commissioner office (government).
- Collaboration with other partners.
- Collaboration with other stakeholders to sensitize by using National big events on tree planting campaign e.g. environmental day, tree planting.
- Involvement of local leaders.
- Websites, social media (face book ,twitter,)
- Community of Practices on INRM-List serve such as Appreciating Inquiry practitioners
- Media , Television, Radios(local FM stations , newsletters, newspapers

-**It is important to pilot test all interventions before they are replicated and incorporated as good practice**. This requires effective use of 'before and after' field tests, and comparison surveys, in order to clearly show impacts.

The Early adapters of these emerging good practices have benefited and therefore become very good agents/champions for propagating upscalling.

For successful uptake of best practice it is important to draw on and invest in specialist capacity to embed meaningful M&E frameworks at the outset of projects and programmes. This will ensure enhanced capacity of all project staff and development of templates for capturing emerging good practices as part of day to day activities of the projet and program implementers.
.

LVBC will play pivotal role in generating, documenting and replicating emerging good practice in integrated Natural resource management in the MRB. Specifically, LVBC role in implementation will be: continue with documentation (b) Equipping partners with tools/guide for documentation c) Regular meetings for sharing and validating emerging good practices d) Reporting of experiences with better practices being replicated in its MRB Web based database.

7.0 CONCLUSION

From the foregoing, it is evidently clear that there are numerous emerging good practices and best practices that will respond to the serious challenges facing MRB natural resource management. This guide has provided tools for documentation, shared some lessons learnt and case studies with success stories on INRM and finally in-depth documentation of good practices within and outside MRB which are applicable to MRB. Documentation of best practices is not worth the paper they are written on unless they are methodically analyzed, contextualized and applied to respond to Environmental challenges of the place under study. Therefore MRB stakeholders will have to identify which of these apply to their programmes and embed these alongside the existing programs as well as in design of new programs that seeks to ensure sustainable management of natural resource in MRB.

8.0 REFERENCES

Improving Livelihoods Through Sustainable Governement, NGO, Private Partnership In South Nandi, Western Kenya End-Review Report May 2012.

LVBC (Lake Victoria Basin Commission), USAID & WWF ESARPO 2011. The Mara River Basin SEA: Trans-boundary Strategic Environmental Assessment. Draft Final Report, Nairobi. LVBC, Kisumu and WWF ESARPO, Nairobi.

Nature Uganda. Report of Lessons Learnt in Implementing Education for sustainable development (ESD) in Katonga River Basin (Masaka and Kyenjojo catchments) by the LVCEEP II, 2008-2011

WWF Education. Methodologies for the future-a guide to develop education for sustainable development

WWF Lake Victoria Catchment Environmental Education Programme (2011): a profile

WWF Report (2012). Learning Sustainable ways

WWF/LVCEEP (2011): Annual Report

WWF/LVCEEP (2011:): A Profile Kesarine & Associates and Eco-Conquest Africa (2007): Final Report of the Mid-term Review of SIDA/Lake Victoria Initiative Support to WWF Lake Victoria Catchment Environmental Education Programme (LVCEEP)

WWF/LVCEEP. Report on WWF Network South-South Exchange Programme, Masaka, Uganda March 1-8, 2012.

WWF/LVCEEP: Phase 2 Progress Report January-December 2011

WWF: Six development areas for Sustainable Development. Framework

9.0 APPENDICES

Annex 1. Terms of reference

3.1 Scope of the Consultancy

The consultancy will document best practices in integrated natural resources management and specifically good practices for conserving water catchments, riverbank management, wildlife management, soil and water conservation and participatory forest management. The consultant will also examine good practices for community participation in INRM.

3.2 Objectives of the Consultancy

Overall Objective

The overall objective of the consultancy is to document and compile a guide for the best practices in INRM including their challenges and propose suitable channels for disseminating such practices.

Specific Objectives

The specific objectives of the consultancy are:-

i) To review existing documents and identify the emerging good practices on INRM applicable to MRB;
ii) To document the identified good practices including challenges for their Implementation; and
iii) To compile the identified good practices into a guide book for wider sharing with the MRB stakeholders.

3.3 Detailed Task Assignments

Specific tasks will include but not limited to:

Specific Objective 1: To review existing documents and identify the emerging good practices on INRM applicable to MRB

i) Undertake desk review of best practices in INRM
ii) Undertake field visits to key stakeholders and appropriate institutions in the field for further review of documents and interviews

Specific Objective 2: To document the identified good practices including challenges for their implementation.

i) Document the best practices using various tools and techniques including pictorial representations
ii) Outline the challenges as regards their implementation in MRB

Specific Objective 3: To compile the emerging good practices into a guidebook for wider sharing with the MRB stakeholders;

i) Present the good practices in narration and pictorial forms in the guide

ii) Propose suitable channels for dissemination of the good practices

3.4 Expected Output of the Consultancy

The consultant will be required to identify, document and compile a guidebook for emerging good practices of INRM as defined in the scope of work

3.5 Qualifications of the Consultant

(a) The Team Leader

The team leader should have at least a Postgraduate degree in Natural Resources Management, or related field. S/he should have a minimum of 10 years of professional experience, including vast experience in management of integrated natural resources.

She/he must be able to demonstrate experience in documentation of best practices in natural resources or related field. Proven organizational skills is an added advantage.

(b) Knowledge Management Expert

He/she shall have at least a Bachelors degree in information science with at least 5 years experience in knowledge management field.

3.6 Duration of the consultancy and Schedule of Deliveries

Expected duration of the assignment

It is estimated that the work will require a maximum input of 15 man days spread over a period not exceeding one month. The work is anticipated to start on 1st June 2012 and is expected to be completed by 30th June 2012.

Schedule of Deliverables

The consultant will report to the Project Coordinator TWBHH-MRB who will be responsible for approving the outputs. The following reports will be submitted by the Consultant:-

i. An inception report 3 days after signing the contract containing a clearly articulated work plan and methodology to be employed,

ii. A draft Report 20 days after signing the contract

iii. Final Report on 30th June, 2012

3.7 Responsibilities of the client

i. Provide all the available relevant reference documents.

3.8 Supervision and reporting arrangements

Supervision of the consultancy will be carried out by PC TWBHH-MRB on behalf of the LVBC.

Annex 2. PERSONS CONSULTED DURING BETTER PRACTICE DOCUMENTATION

A. LIST OF PARTICIPANTS ATTENDING LOCAL AUTHORITIES TRAINING ON INTEGRATED NATURAL RESOURCES MANAGEMENT FOR ENHANCED MANAGEMENT OF MARA RIVER BASIN ON 17ᵀᴴ – 19ᵀᴴ AUGUST, 2011, UFANISI RESORT, KISII, KENYA

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Annex 3.Priority Tools for Documenting Emerging Good Practices in Integrated Natural Resource Management INRM

Box 3: Tool 1: Better Practice Documentation Guide (take the tools to the annexe)

Tool Format:

Name of Better Practice:

Better Practice Location:

1. The Need: The status of the problem in the sector, the challenge that proposed better practice seeks to resolve.

2. The Better Practice:

- Name and description of the better practice,
- some background to its development
- justification for the better practice

3. The Application

- State the steps for applying the practice
- Show some examples of the application(graphics, images, photos, etc)

4. The Results

Indicate the results realized as a result of applying the better practice

- e.g. due to application of the computerized system, they were able to service three times as many sites as anticipated.
- Instead of drugs lasting 12 months for 163 sites, they lasted 29 months for over 500 sites
- Evidence of the change realized by applying the better practice
- Cost effectiveness if you can demonstrate

5. Challenges
- State here the challenges faced with the best practice.
- State challenges anticipated in replicating the better practice

6. Sustainability
Mechanisms/Ways of ensuring the practice can last for a longer time beyond the initial project period

7. Lessons learned
Discovery or new information that will help guide future planning or implementation

8. Transferability
Considerations for setting up a similar practice in a different location. It guides on what to do ensure that the practice benefits from the knowledge already generated in perfecting the practice.

Contact Information for the Better Practice:
Name:
Contact address:
Phone, email, website:
And Alternative contact for the documentation/publication:
Date of publication:

Table 6: Better Practice Documentation Guide

Tool 4: Success Story Documentation

Description

Is a description of the practice that is considered to have yielded the expected result or even beyond expectations. The write-up gives readers a chance to **see** and **feel** what happened (**the process**) and what was responsible for the success (**positive outcomes, end results, benefits**).

Box 10: Components of Success Story

Components of Success Story

- **Headline** – Good headlines or titles are simple, jargon-free, and have impact; they summarize the story in a nutshell; and include action verbs that bring the story to life. Your headline should include words that captivate (catch one's attention).

- **Subhead** – Use the subhead to expand on the headline, humanize the story, or highlight a key fact. Titles are simple, jargon-free and have impact. Your subhead should use very few words

- **"story lead"** – The story lead grabs the readers' attention while presenting the case and setting up the need for a solution

- Introduces the character, conflict, and opportunity in 2-3 paragraphs

- Two good ways to do this is to present the conflict or share a first person account. The first two paragraphs needs to showcase the challenge, which the person encountered, and

---

Box 11: Components of Success Story-Cont'd

- Summary - The final section describes the end result or benefit

- What changed? What was learned? What was received? What was the impact?

- Use concrete results and measures of improvement. How did this make a difference in the community?

- Use this section to tie in the story elements and end the story with a powerful close in 2-3 paragraphs.

- Pullout Quote – provide a quote that represents and summarizes the story. This quote should capture the success of the program and will be highlighted in the piece.

Tool 5: Most Significant Change (MSC)

Tool Description

The **most significant change (MSC)** technique is a form of participatory monitoring and evaluation. The process involves the collection of significant change (SC) stories emanating from the field level, and then systematic selection of the most significant of these stories by panels of designated stakeholders or staff. The designated staff and stakeholders are initially involved by 'searching' for project impact. Once changes have been captured, various people sit down together, read the stories aloud and have regular and often in-depth discussions about the value of these reported changes. When the technique is implemented successfully, whole teams of people begin to focus their attention on program impact.

Box 7: Case Study Documentation Format

a. Title
b. Challenge
c. Program/Projects/Activity
d. Outcomes
e. Key success factors
f. Main obstacles/Challenges
g. Looking ahead-Sustainability and Transferability
h. Further Information