Nile Equatorial Lakes Subsidiary Action Program

FEASIBILITY STUDY AND PREPARATION OF AN INTEGRATED WATERSHED MANAGEMENT PROGRAM AND INVESTMENT PROPOSAL FOR SIO-MALABA-MALAKISI SUB BASIN

Final Report

Annex 5 – IWM Investment Project

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CHAPTER 1.Introduction

The Sio-Malaba-Malakisi Integrated Watershed Management seeks to champion development that ensures conservation, regeneration and the judicious use of all the natural resources such as land, water, plants, animals etc. within the watershed. The proposed watershed investment options tries to bring about the best possible balance in the environment between natural resources on the one side, and human on the other.

The proposed Sio-Malaba–Malakisi Watershed project will finance investments that are intended to assure sustainable watershed development and management in the project districts in both Uganda and Kenya. The project interventions are, therefore, expected to result in benefits to the rural communities, through improved water quality, reduced soil erosion and nutrient loss, improved vegetation, increased fodder availability, increased agricultural production, increased incomes, enhanced food security, etc.

CHAPTER 2.Program, components, projects and investment plan

PROGRAM RATIONALE

The Integrated Watershed Management Program for the Sio-Malaba-Malakisi basin responds to a logics of unity (as a program) and diversity (as projects and sub-projects supporting community level actions). The Program approach is extremely important, because it highlights two basic facts:

- isolated actions will not fully solve the main issues currently faced by the basin's inhabitants,;
- three fundamental concepts must be borne in mind in each step of the programme:
    - need for actions on the environment in all specific areas and regions of the basin, this concept has been put, for writing simplification, under the term Watershed Conservation;
    - need for interventions aiming at solving the increasing poverty problem, in the shortest possible time; this is termed as Income Generation;
    - need to ensure a sustainable framework for management of the actions above, by preparing a sound institutional framework and a basis of capacity at different levels, named as Watershed Management

Only through concerted actions at different levels and in the different areas of the basin will it be feasible to mitigate, stop or even reverse the current negative trend, such as soil erosion, decrease in soil fertility, drought and flood events, degradation of wetlands, degradation of water quality, and, as a consequence of all these problems, decreasing per capita income in most of the basin

It is also necessary, not only for a maximum efficiency but also because it is part of the current decentralization policy of both Kenya and Uganda, to place local authorities and communities at the centre of project implementation process. And this leads the project identification and preparation process to define sub-projects with localized influence.

COSTS AND BENEFITS

This double focus also reflects in the form that project evaluation has been performed and is presented.

The investment program is prepared along the three components of the Logical Framework presented in the Main Report: Watershed Conservation, Income Generation and Watershed Management, composing the Integrated Watershed Management Program, plus the additional components of Urban Infrastructure and Project Management. Costs are presented sorted against these lines.

Linking benefits to these components cannot show a balanced among them – as explained in Section 8.2 of the Main Report – because the types of benefits expected from each component are very different, in timing and in amount. This led to realizing the benefits evaluation by sector project – each sector project including, up to different levels, the three components.

The program expenditures aim at setting up the framework in which the activities can develop and providing support for such aspects like capacity building and legal/regulatory aspects. There is no direct benefit in economic or financial terms to be compared with these program costs.

At the other end of the process, the farmers and other inhabitants are currently developing their activities, for which they bear costs and obtain incomes; with the development of the sub-projects implemented in their areas, their activity is expected to be modified, with different costs (physical inputs, labour costs, marketing costs) and different income (different products with different unit prices, improved yields). Higher incomes are expected as a result of all sub-projects (project benefits), although positive financial results may take a longer time to be proven in case of forestry, for instance than for conservation agriculture.

This is reflected from the beginning of program implementation, in terms of financial costs and benefits for the farmers, or group of farmers in case of small community undertakings such as tree nurseries or beekeeping groups.

HORIZON FOR EVALUATION

In projects directed towards agriculture and other natural resources, the evaluation period should not be limited to the project implementation time. Indeed the investments are meant for a longer time, and then benefits also should be estimated for more years. In the present case, the program disbursement schedule spreads over 5 years, but full advantage of this investment will only be obtained after a longer time, because of:

- The time to implement the activities over a number of districts and communities;
- The delay, for each activity, between implementing and obtaining quantifiable benefits; this, of course, depends on the type of project and activity: forestry has a longer timeframe than agriculture, which in turn is slower than fisheries or beekeeping, for instance;

- The need to take a timeframe that can also include non-quantifiable benefits like environmental and social results; since these benefits are also to be compared with the investments realized.

It has been decided to take a 20-year horizon for all projects when analyzing costs versus benefits.

CHAPTER 3.Synthesis of proposed Sector Projects

It needs to be highlighted once more that the sector projects are part of an investment program, and that implementation of the different projects along a reduced time will be the best guarantee for good results.

It is also important to start, as early as possible, with implementation of the different projects, and not to wait for all of them to be ready and fully funded before activities begin. This is why the investment program is presented as a series of sector projects that can be implemented independently. The institutional set-up includes coordinating entities, at watershed level and at Kenyan and Ugandan level, to ensure the maximum synergy from the different activities, because the sub-projects are meant to be implemented and realized in separate actions.

3.1 Sector Project 1: Catchment Rehabilitation and Management

3.1.1 Sector project 1A: Afforestation

EXPECTED OUTPUTS

The sub-project key outputs are the followings:

A. Intervention areas to be rehabilitated are identified and characterized, reforestation plans are produced, management mechanisms are proposed and this basic information is disclosed and discussed with communities.

B. Community associations (CFAs, CFUGs…) are identified and members are trained; extension staff are equipped and trained to organize, facilitate and provide on-going support to community associations; Research institutes are identified and involved in specific supportive tasks.

C. Nurseries are operational and seedlings available for reforestation operations.

D. Knowledge networks for exchanging experiences are established at local and transboundary levels

E. Farmers are undertaking reforestation operations on private plots and community areas

F. Reforestation operations are carried out in governmental forests

G. Possible alternatives to fuel wood or energy saving technologies are selected and promoted in the watershed (improved cook stove, improved charcoal oven, solar cook stove, biomass cook stove, improved fish smoker…)

H. Equipment and tools are available: local manufacturers and retail sector are able to supply improved

TARGET AREAS

The targeted areas are upper catchment areas mainly the Mont Elgon forest reserve and its surrounding areas, but also degraded hills in the upper and middle catchment.

The districts involved are

- Manafwa, Teso North and Busia in Uganda;
- Mt Elgon, Bungoma West in Kenya

The potential for reforestation has been evaluated to 4884 ha in Kenya and 5572 ha in Uganda.

MEANS

The Afforestation sub-project will be concerned with afforestation activities on gazetted forest land and community or private woodlands. Afforestation would be organized and coordinated by forestry district officers (KFS) in Kenya and MWE-FSSD Officers in Uganda. In Uganda, intervention on governmental forests only will be driven by NFA officers.

Labour for land preparation and plantation will be recruited from local communities.

The project will fund settlement and equipment of community or private nurseries to allow an easy access to seedlings for afforestation operations.

The project will fund seedlings and inputs fro plantation on private and community woodplots

QUANTITIES

The Objective is to restore around 5 000 ha in Kenya and 5 000 ha in Uganda

With a density around 1 500 seedlings/ha, the corresponding total of seedling to be produced along the 5 years is: 15 000 000 plants

This production may be reach by 100 nurseries (30 000 seedlings /year during 5 years) established in and around the targeted areas.

A total of 50 CFA or CFUG will be involved in the project implementation.

COSTS AND BENEFITS

Year	Earnings	Costs	Net Benefits
1	- 282,00	1137,25	- 1 419
2	- 282,00	1603,25	- 1 885
3	- 229,50	1599,25	- 1 829
4	- 229,50	1885,25	- 2 115
5	2 040,50	1843,25	197
6	4 310,50		4 311
7	6 580,50		6 581
8	11 875,50		11 876
9	14 145,50		14 146
10	11 875,50		11 876
11	9 605,50		9 606
12	7 335,50		7 336
13	2 665,50		2 666
14	395,50		396
15	395,50		396
16	395,50		396
17	395,50		396
18	395,50		396
19	395,50		396
20	395,50		396
Net Present Value (NPV)			***19 246 €***
Internal Rate of Return (IRR)			***42%***

Activity	Unit	Quantities						Unit Cost ($x'000)	Totals USDx'000					
		year 1	year 2	year 3	year 4	year 5	Total		year 1	year 2	year 3	year 4	year 5	Total
Afforestation Project														
1 Field staff costs														
Project Forestry officers /extension staff 1 per district / 5 districts	pmonth	60.00	60.00	60.00	60.00	60.00	**300.00**	2.00	120.00	120.00	120.00	120.00	120.00	600.00
facilitators 2 persons / district / 5 districts	pmonth	120.00	120.00	120.00	120.00	120.00	**600.00**	2.00	240.00	240.00	240.00	240.00	240.00	1,200.00
Subtotal 1									**360.00**	**360.00**	**360.00**	**360.00**	**360.00**	**1,800.00**
2 Equipment/Material														
Equipement set for staff	unit	15.00					**15.00**	1.20	18.00	0.00	0.00	0.00	0.00	18.00
Subsidiary fund for CFA equipement	Lumpsum	10.00	10.00	10.00	10.00	10.00	**50.00**	1.00	10.00	10.00	10.00	10.00	10.00	50.00
Motorbikes	unit	15.00			4.00		**19.00**	3.00	45.00	0.00	0.00	12.00	0.00	57.00
Planting material (for labour team / CFA CFUG)	lumpsum	10.00	10.00	10.00	10.00	10.00	**50.00**	3.25	32.50	32.50	32.50	32.50	32.50	162.50
Equipement for Nursery establishement	Lumpsum	10.00	30.00	30.00	30.00		**100.00**	1.00	10.00	30.00	30.00	30.00	0.00	100.00
Subtotal 2									**115.50**	**72.50**	**72.50**	**84.50**	**42.50**	**387.50**
3 Workshops & meetings														
Workshops and meetings	lumpsum	5	5	5	5	5	**25**	1.75	8.75	8.75	8.75	8.75	8.75	43.75
farmers visits costs by FFS	lumpsum		10	10	10	10	**40**	0.50	0.00	5.00	5.00	5.00	5.00	20.00
Subtotal 3									**8.75**	**13.75**	**13.75**	**13.75**	**13.75**	**63.75**
4 Transport & other operation costs														
Transportation of seedlings (1 per year and per nursery)	lumpsum	100	100	100	100	100	**500**	0.50	50.00	50.00	50.00	50.00	50.00	250.00
Transboundary traveling	lumpsum	3	3	3	3	3	**15**	2.00	6.00	6.00	6.00	6.00	6.00	30.00
Motorbikes operating costs (9 motorbikes)	month	180	180	180	180	180	**900**	0.05	9.00	9.00	9.00	9.00	9.00	45.00
Subtotal 4									**65.00**	**65.00**	**65.00**	**65.00**	**65.00**	**325.00**
5 Consultancies														
Preliminary survey and implementation plan	pmonth	6					**6**	10.00	60.00	0.00	0.00	0.00	0.00	60.00
Carbon market and PES opportunities and mechanisms	pmonth		2				**2**	17.00	0.00	34.00	0.00	0.00	0.00	34.00
Training extension specialist	pmonth	3	3	3	2	2	**13.00**	6.00	18.00	18.00	18.00	12.00	12.00	78.00
Subtotal 5									**78.00**	**52.00**	**18.00**	**12.00**	**12.00**	**172.00**
6 Funds and Revolving funds														
Fund for rehabilitation intervention (2x5000 ha)	ha	1000	2000	2000	2000	2000	**9,000.00**	0.50	500.00	1,000.00	1,000.00	1,000.00	1,000.00	4,500.00
Revolving fund for nursery operation	unit	10.00	40.00	70.00	100.00	100.00	**320.00**	1.00	10.00	40.00	70.00	100.00	100.00	320.00
Subtotal 6									**510.00**	**1,040.00**	**1,070.00**	**1,100.00**	**1,100.00**	**4,820.00**
Sub-total 1 to 6														**7,568.3**
7 Funds for ESMF														**189.21**
Subtotal Afforestation									**1,137.3**	**1,603.3**	**1,599.3**	**1,635.3**	**1,593.3**	**7,757.46**

3.1.2 Sector Project 1B. Soil and Water Conservation / Agroforestry

EXPECTED OUTPUTS

The key outputs of the sub-project 1B are the following:

A. Identification of SC intervention areas and mapping; project design for stabilization and production of stabilization plans for each SC areas

B. Major erosion figures (lavakas, major gullies and landslides) are treated in the intervention areas; Maintenance of works is organized

C. SC Committees are identified, FFS are created and members are trained; Extension staff are trained to organize, able to facilitate and provide on-going support to committees; Research institutes are identify and involved in specific tasks

D. Equipment and tools are available (Owners of draught animal power (DAP) and tractors are able to offer hire-services to other farmers + Local manufacturers and retail sector are able to supply tools and equipment suitable for conservation agriculture practices to farmers).

E. Revolving funds/micro-credit mechanism is established and accessible to farmers. Farmers adopt and apply practices for soil erosion control and agroforestry;

F. Farmers adopt and apply practices for soil erosion control and agroforestry; Rational use of fertilizers and other agricultural inputs has improved; Non point pollution in the river bodies has decreased.

G. Farmers have access to market for their cash crop production and other products.

H. Local water fund is established and operational; Targeted infrastructures are identified, works are planned and implemented, operation and maintenance framework is established.

I. Knowledge networks for exchanging experiences are established at local and transboundary levels

TARGET AREAS

Intervention areas are the areas with high priority for catchment rehabilitation. These include:

- Manafwa district – southeastern part
- Tororo district – eastern part
- Mount Elgon district - mainly Cheptais division
- Bungoma West district - Sirisia division
- Bungoma West district - Malakisi division

- Bungoma South district – scattered areas
- Teso North district – hilly areas
- Teso South district – hilly areas

MEANS

Activities will be undertaken within SC units including both private lands and communal lands and through the creation of SC committees.

The project will fund directly:

- Preliminary investigations and consultancies needed to produce the Land stabilization plans (for each SC unit);
- Civil works, tools and equipment and inputs needed for stabilization of major erosion figures;

Committees will provide labour for stabilization biological techniques;

Applying of agroforestry and other agricultural practices promoted will be implemented by individuals farmers on their own plots.

Farmers will have access to revolving funs for their investment (tools, seeds, service hiring…)

Funding for local water development activities would be requested by individual farmers, farmer collectives, villages, or WRUAs. Because of its relevance for IWMP, it is recommended to create a SMM Local Water Development Fund, to be managed by the Project Management Unit office (Financial Manager).

QUANTITIES

The Soil and water Conservation Project is supposed to start with a first phase with a duration of 5 years. This is considered as a minimum period where tangible outputs can be expected, given the gradual take off of implementation and the innovative character of suggested measures. Since programs of this kind are generally having an impact growing substantially only after longer period, a donor should preferably be prepared to a longer term commitment.

A tentative estimation can be made of extents of areas rehabilitated. Community Mobilizations Officers (CMOs) and District Technical Officers (DTOs) would be deployed in 8 districts; the number of CMO and DTOs will be double in Bungoma West. A realistic and modest implementation rate would imply mobilization of communities and implementation starting at about 5 sites per District Technical Officer in year 1, each adding about 10 new sites per year in following years.

One site may imply one advanced farmer, a group of farmers or an entire village community, but an average of 10 households is assumed per site, each implementing in an area of about 0.5 ha (half the size of their farm holding). Two division extension staff would each add 3 sites in year 2; 5 sites in year 3-5.

Through the FFS system, from year 3 onwards, an increasing number of farmers (households) would individually start activities on half their farm holding (0.5 ha):

100 HH per district in year 3; 200 HH in year 4; 300 HH in year 5.

The cumulative affected area could amount to about 6,600 ha, which is over 12 % of the priority areas:

Year	Channels	Sites	Households	Unit area (ha)	Total area (ha)
1	16 FTO	5	10	0.5	400
2	16 FTO 16 Ext Agents	10 3	10 10	0.5 0.5	800 240
3	16 FTO 16 Ext Agents 8 FFS	10 5	10 10 100	0.5 0.5 0.5	800 400 400
4	16 FTO 16 Ext Agents 8 FFS	10 5	10 10 100	0.5 0.5 0.5	800 400 400
5	16 FTO 16 Ext Agents 8 FFS	10 5	10 10 200	0.5 0.5 0.5	800 400 800
Total					6 640

COSTS AND BENEFITS

All values are shown in thousands of US dollars (USD '000)

Stakeholder analysis

Year	Earnings	Costs	Net Benefits
1	957	622	335
2	4 780	942	3 838
3	11 298	2 331	8 967
4	25 766	4 636	21 129
5	39 505	7 382	32 124
6	42 139	8 487	33 652
7	42 139	8 128	34 010
8	42 139	8 128	34 010
9	42 139	8 128	34 010
10	42 139	8 128	34 010
11	42 139	8 487	33 652
12	42 139	8 128	34 010
13	42 139	8 128	34 010
14	42 139	8 128	34 010
15	42 139	8 128	34 010
16	42 139	8 487	33 652
17	42 139	8 128	34 010
18	42 139	8 128	34 010
19	42 139	8 128	34 010
20	42 139	8 128	34 010
Net Present Value (NPV)			***172 492***

Project analysis

Year	Earnings	Costs	Net Benefits
1	335	1 973,85	- 1 639
2	3 838	1 663,30	2 175
3	8 967	1 631,30	7 336
4	21 129	1 683,30	19 446
5	32 124	1 627,30	30 496
6	33 652		33 652
7	34 010		34 010
8	34 010		34 010
9	34 010		34 010
10	34 010		34 010
11	33 652		33 652
12	34 010		34 010
13	34 010		34 010
14	34 010		34 010
15	34 010		34 010
16	33 652		33 652
17	34 010		34 010
18	34 010		34 010
19	34 010		34 010
20	34 010		34 010
Net Present Value (NPV)			***166 249***

Activity	Unit	Quantities						Unit Cost	Totals USDx'000					
		year 1	year 2	year 3	year 4	year 5	Total	($x'000)	year 1	year 2	year 3	year 4	year 5	Total
Soil Conservation - Agroforestry Project														
1 Field staff Cost														
gov SC district officers /extension staff 2 per disctrict (*2 for Bungoma w)	pmonth	192.00	192.00	168.00	192.00	192.00	**936.00**	2.00	384.00	384.00	336.00	384.00	384.00	1,872.00
SC Project officer 2 per district 2 per district	pmonth	192.00	192.00	192.00	192.00	192.00	**960.00**	2.00	384.00	384.00	384.00	384.00	384.00	1,920.00
Community mobilisation officers 2 per district	pmonth	192.00	192.00	192.00	192.00	192.00	**960.00**	2.00	384.00	384.00	384.00	384.00	384.00	1,920.00
gov Frontline officers 2 per district	pmonth	192.00	192.00	192.00	192.00	192.00	**960.00**	0.50	96.00	96.00	96.00	96.00	96.00	480.00
Subtotal 1									**1,248.00**	**1,248.00**	**1,200.00**	**1,248.00**	**1,248.00**	**6,192.00**
2 Equipment/Material														
upgrading district division GIS facilities (computer, software, digitizer table, printer…)	Lumpsum	8.00					**8.00**	2.50	20.00	0.00	0.00	0.00	0.00	20.00
equipement set for staff (GPS, clinometers, cell. Phones, computers…)	unit	64.00					**64.00**	1.20	76.80	0.00	0.00	0.00	0.00	76.80
Procurement seeds selected planting material	Lumpsum	5.00	10.00	10.00	10.00	10.00	**45.00**	3.25	16.25	32.50	32.50	32.50	32.50	146.25
nursery equipement by Nursery	unit	5.00	10.00	10.00	10.00	10.00	**45.00**	1.00	5.00	10.00	10.00	10.00	10.00	45.00
subsidiary fund for CBO equipement (including small implementing equipement)	Lumpsum	5.00	10.00	10.00	10.00	10.00	**45.00**	1.00	5.00	10.00	10.00	10.00	10.00	45.00
Motorbikes	unit	64.00			20.00		**84.00**	2.50	160.00	0.00	0.00	50.00	0.00	210.00
Subtotal 2									**283.05**	**52.50**	**52.50**	**102.50**	**52.50**	**543.05**
3 Workshops & meetings														
Workshops and meetings	lumpsum	8	8	8	8	8	**40**	1.75	14.00	14.00	14.00	14.00	14.00	70.00
farmers visits costs by CFA/CBO/FFS	lumpsum	50	50	50	50	50	**250**	0.50	25.00	25.00	25.00	25.00	25.00	125.00
Subtotal 3									**39.00**	**39.00**	**39.00**	**39.00**	**39.00**	**195.00**
4 Transport & other operation costs														
Transboundary traveling	lumpsum	10	10	10	10	10	**50**	3.00	30.00	30.00	30.00	30.00	30.00	150.00
Motorbikes operating costs (8 motorbikes)	month	96	96	96	96	96	**480**	0.05	4.80	4.80	4.80	4.80	4.80	24.00
Subtotal 4									**34.80**	**34.80**	**34.80**	**34.80**	**34.80**	**174.00**
5 Consultancies														
Community mobilization/capacity builidng trainer/adviser (national)	pmonth	3	2	1	0	0	**6**	6.00	18.00	12.00	6.00	0.00	0.00	36.00
Training extension trainer/adviser	pmonth	3	2	1	0	0	**6**	6.00	18.00	12.00	6.00	0.00	0.00	36.00
national soil conservation/agroforestry trainer/adviser	pmonth	3	2	1	1	1	**8.00**	6.00	18.00	12.00	6.00	6.00	6.00	48.00
IWM adviser (international expert)	pmonth	3		2			**5**	17.00	51.00	0.00	34.00	0.00	0.00	85.00
unspecified consultancies national	pmonth	3	2	2	2	1	**10**	6.00	18.00	12.00	12.00	12.00	6.00	60.00
unspecified consultancies international	pmonth	2	1	1	1	1	**6**	17.00	34.00	17.00	17.00	17.00	17.00	102.00
Subtotal 5									**157.00**	**65.00**	**81.00**	**35.00**	**29.00**	**367.00**
6 Revolving funds														
Develpment fund	lumpsum	1	1	1	1	1	**1**	200.00	200.00	200.00	200.00	200.00	200.00	1,000.00
Revolving fund for CBO operation	lumpsum	120.00	240.00	240.00	240.00	240.00	**1,080.00**	0.10	12.00	24.00	24.00	24.00	24.00	108.00
Subtotal 6									**212.00**	**224.00**	**224.00**	**224.00**	**224.00**	**1,108.00**
Subtotal 1 to 6														**8,579.05**
7 Funds for ESMF														**214.48**
Subtotal Soil & Water Conservation - Agroforestry									**1,973.9**	**1,663.3**	**1,631.3**	**1,683.3**	**1,627.3**	**8,793.53**

3.1.3 Sector Project 1C. Conservation Agriculture

EXPECTED OUTPUTS

The sub-project key outputs are the followings:

A. Target intervention areas and techniques to be promoted are identified

B. Extension staff are equipped and trained to organize, facilitate and provide on-going support to operational CA-FFS and apply participatory extension approach for CA development

C. CA equipment and tools are available (Owners of draught animal power (DAP) and tractors are able to offer hire-services in CA practices to other farmers + Local manufacturers and retail sector are able to supply tools and equipment suitable for conservation agriculture practices to farmers)

D. Revolving funds / micro-credit mechanisms is established and accessible to farmers

E. Farmers adopt and apply conservation agriculture practices;. Rational use of fertilizers and other agricultural inputs has improved

F. Farmers have access to market for their cash crop production

G. Knowledge networks for exchanging experiences are established at local and transboundary levels

TARGET AREAS

The CA subproject would cover all districts included in the CRMP, i.e. Tororo and Manafwa in Uganda and Bugoma and Teso districts in Kenya, and include also those parts of Busia Kenya and Busia Uganda districts that are not fully dominated by the sugarcane sector.

MEANS

The project will promote further introduction of Conservation Agriculture as a relatively new agricultural technology to smallholder farming systems in SMM districts of Kenya and Uganda with the aim of raising agricultural productivity and using scarce natural resources in a more sustainable and efficient way.

The project will build on the momentum in CA development created by previous projects in Bungoma in Kenya and in Tororo and Busia in Uganda.

Where necessary, it will revitalize and consolidate the network of knowledgeable persons in this field, at the level of

- district government line agencies,
- research and training institutions (NARO, KARI),
- Agricultural Development Training Centers,
- Farmer Field Schools and local communities (trained farmers from previous projects),
- Members of the African Conservation Tillage (ACT) Network, FAO/GTZ SARD program.

A workshop will be organized in each participating country to discuss previous experiences and lessons learnt, with regard to technologies propagated and to procedures of contacting communities, creating new farmer field schools (FFS), and methods of upscaling. “Long lists” of technologies will be compiled that appear most relevant to the CRMP project and prevailing agro-climatic conditions.

Main elements of project design are:

- Promotion of Conservation Agriculture with the three key principles: i) minimum soil disturbance, ii) soil cover (with mulch, or cover crops, preferably legumes) and iii) crop rotation or association.
- Support to farmer groups via Farmer Field Schools (FFS).
- Encouragement and support of service providers such as local hire services for no-till farming operations and national manufacturers of machinery (sub-soilers, rippers, and direct seeders).

A project CA Officer, trained by the project’s CA specialist, will be appointed in each district (8 in total), to assist in the work of trained farmers from previous projects (CA Facilitators) and government extension staff. Trained farmers (CA facilitators) and government extension staff will receive follow up training by the project’s CA specialist, in cooperation with the African Conservation Tillage Network and national research institutes (NARO and KARI). A well designed training curriculum exists for this purpose, formulated by the previous projects, and comprehensive and well designed training material is available.

The CA facilitators and extension staff will promote, and assist in creation of, new FFS for conservation agriculture. Trained farmers will act as CA facilitators to new FFS. Exchange visits to existing FFS will add to the acceptance on new sites.

QUANTITIES

FFS are operated by farmer groups. Main elements of the FFS concept will be:

- Farmer groups (up to 25 members of women and men) are guided by extension workers in experimentation and learning of Conservation agriculture until they graduate as CA-farmers (earliest after 1, latest after 3 years).
- Each farmer group conducts a field trial, in which various CA measures (subsoiling, legume cover etc.) are compared with the traditional farming method with respect to plant development, yield etc. Farmer groups use an experimental lay-out and receive a modest subsidy for an input package (fertilizer, herbicides and seed and shared machinery for the experiment),
- The field implementation is supported by national extension services under guidance and supervision of national agricultural research institutions (KARI and NARO).
- Farmer groups are supported to exchange experiences between each other and to join local CA networks for continued cooperation.

Focus will be put on farmer-led FFS, as opposed to extension staff-led FFS, to reduce costs and increase the number. Extension staff should backstop farmer field school groups technically, and not be the main facilitators. They pay regular visits (in monthly intervals during the growing season) to the farmer groups until they are graduated

A project revolving fund should be created to finance operation of FFS. Previous experience has shown that FFS can be operated at a cost of about 10 US$ per farmer. That translates into a grant of a few hundred dollars per group. Other stakeholders could be invited to participate in joint funding of farmer field schools.

Relationships will be established with local (private or government) credit facilitators to enable farmers to invest in inputs required to apply what they have learned.

Contacts will be renewed with local manufacturers in Kenya and Uganda producing small CA implements. Batch orders could be placed through the project or by ministries of agriculture and other institutions.

The project will be allocated a subsidy budget fund to buy a number of small implements for demonstration purposes, and to hire larger implements for one-time initial land preparation where needed.

A project period of five years would be required to obtain substantial outputs. Since programs of this kind are generally having an impact growing substantially only after longer period, a donor should preferably be prepared to a longer term commitment.

Based on experience in previous projects in the region, the following implementation rates can be anticipated. If three extension staff are allocated per district to work with the project, and sufficient CA facilitators can be found to join them, the number of new FFS for conservation agriculture can amount to:

Year	Districts	Ext Agents	New FFS	Total FFS
1	10	3	5	150
2	10	3	10	300
3	10	3	10	300
4	10	3	10	300
5	10	3	10	300
Total				1 350

It can also be anticipated (through experience in previous projects) that

- one FFS is run by a group of 20 farmers,
- full implementation is achieved in 5 years
- farmers will implement conservation agriculture on about 50 % of their own farm.

The project would progressively achieve introduction of conservation agriculture on: 13 500 ha

COSTS AND BENEFITS

All values are shown in thousands of US dollars (USD ‘000)

Stakeholder analysis

Year	Earnings	Costs	Net Benefits
1	-	-	-
2	529	150	379
3	2 380	675	1 705
4	6 346	1 800	4 546
5	13 221	3 750	9 471
6	21 814	6 187	15 627
7	25 780	7 312	18 468
8	28 424	8 062	20 362
9	29 746	8 437	21 309
10	29 746	8 437	21 309
11	29 746	8 437	21 309
12	29 746	8 437	21 309
13	29 746	8 437	21 309
14	29 746	8 437	21 309
15	29 746	8 437	21 309
16	29 746	8 437	21 309
17	29 746	8 437	21 309
18	29 746	8 437	21 309
19	29 746	8 437	21 309
20	29 746	8 437	21 309
Net Present Value (NPV)			***87 586 €***

Project analysis

Year	Earnings	Costs	Net Benefits
1	-	738,50	- 739
2	379	914,00	- 535
3	1 705	927,00	778
4	4 546	951,00	3 595
5	9 471	964,00	8 507
6	15 627		15 627
7	18 468		18 468
8	20 362		20 362
9	21 309		21 309
10	21 309		21 309
11	21 309		21 309
12	21 309		21 309
13	21 309		21 309
14	21 309		21 309
15	21 309		21 309
16	21 309		21 309
17	21 309		21 309
18	21 309		21 309
19	21 309		21 309
20	21 309		21 309
Net Present Value (NPV)			***84 386 €***
Internal Rate of Return (IRR)			***144%***

Activity	Unit	Quantities						Unit Cost ($x'000)	Totals USDx'000					
		year 1	year 2	year 3	year 4	year 5	Total		year 1	year 2	year 3	year 4	year 5	Total
Conservation Agriculture Project														
1 CRMP Field staff = current cost														
Gov CA officers /extension staff 10 persons = 1 per district	pmonth	120.00	120.00	120.00	120.00	120.00	**600.00**	2.00	240.00	240.00	240.00	240.00	240.00	1,200.00
Advanced farmers/ FFS leaders = 1 per 1 FFS 10% time	pmonth	150.00	450.00	750.00	1,050.00	1,350.00	**3,750.00**	0.10	15.00	45.00	75.00	105.00	135.00	375.00
Subtotal 1									**255.00**	**285.00**	**315.00**	**345.00**	**375.00**	**1,575.00**
2 Equipment/Material														
equipement set for staff (30 persons) / GPS, cellphones, laptop...	unit	30.00					**30.00**	1.20	36.00	0.00	0.00	0.00	0.00	36.00
subsidiary fund for FFS equipement	Lumpsum	150.00	300.00	300.00	300.00	300.00	**1,350.00**	1.00	150.00	300.00	300.00	300.00	300.00	1,350.00
Motorbikes	unit	30.00			10.00		**40.00**	2.50	75.00	0.00	0.00	0.00	0.00	75.00
Subtotal 2									**261.00**	**300.00**	**300.00**	**300.00**	**300.00**	**1,461.00**
3 Workshops & meetings														
Workshops and meetings	lumpsum	10	10	10	10	10	**50**	1.00	10.00	10.00	10.00	10.00	10.00	50.00
farmers exchange visits costs by FFS	lumpsum	150.00	300.00	300.00	300.00	300.00	**1,350**	0.50	75.00	150.00	150.00	150.00	150.00	675.00
Subtotal 3									**85.00**	**160.00**	**160.00**	**160.00**	**160.00**	**725.00**
4 Transport & other operation costs														
Transboundary traveling	lumpsum	10	10	10	10	10	**50**	3.00	30.00	30.00	30.00	30.00	30.00	150.00
Motorbikes operating costs (30 motorbikes)	month	360	360	360	360	360	**1800**	0.05	18.00	18.00	18.00	18.00	18.00	90.00
Subtotal 4									**48.00**	**48.00**	**48.00**	**48.00**	**48.00**	**240.00**
5 Consultancies														
Unspecified consultancies	pmonth	2	2	1	1		**6**	17.00	34.00	34.00	17.00	17.00	0.00	102.00
Training extension specialist (national consultant)	pmonth	3	2	2	1	1	**9.00**	6.00	18.00	12.00	12.00	6.00	6.00	54.00
Subtotal 5									**52.00**	**46.00**	**29.00**	**23.00**	**6.00**	**156.00**
6 Revolving funds														
Revolving fund for Farmers operation	lumpsum	3,750.00	7,500.00	7,500.00	7,500.00	7,500.00	**33,750.00**	0.01	37.50	75.00	75.00	75.00	75.00	337.50
Subtotal 6									**37.50**	**75.00**	**75.00**	**75.00**	**75.00**	**337.50**
Subtotal 1 to 6														**4,494.5**
7 Funds for ESMF														**112.36**
Subtotal Conservation Agriculture									**738.5**	**914.0**	**927.0**	**951.0**	**964.0**	**4,606.86**

3.1.4 Sector Project 1D. Riverbank protection

EXPECTED OUTPUTS

The sub-project key outputs are the following:

- Guidelines for riverbank protection and restoration are produced, printed and disseminated
- Community awareness, knowledge of laws and capacities towards riverbank protection and restoration are increased
- Pilot areas representatives of different type of degradation are identified and mapped, restoration operation are implemented with promoted techniques on pilot areas

TARGET AREAS

The riverbank protection component in principle would have to be implemented in banks of most of the main streams in the SMM basin, some of which extend beyond the proposed CRMP intervention area. This would necessitate a project with too large an intervention zone to be effective. Highest priorities seem to exist in the Middle Catchment zones. It is therefore suggested that, first, the CRMP adopts the issue of riverbank protection as far as these banks are included in the intervention area for soil conservation, conservation agriculture, and agroforestry promotion. In the remaining parts of SMM basin, riverbank protection would subsequently be dealt with in a separate program or in a second phase of the riverbank protection project.

In areas touched by the Wetland Management project, riverbank protection will automatically be part and parcel of wetland management activities.

Priority sites or priority riverbank sections will be indicated by stakeholder technical agencies already active in this field, and by local communities. Other sides will be added as a result of riverbank reconnaissance.

MEANS

Preliminary surveys will be implemented by consultancy services provided by riverbank protection experts. They will monitor then supervise the implementation process all along the 5-years of the project. Implementation of field will be managed by 6 technical field officers with an agroforestry or forestry background, 1 per districts targeted for riverbank protection activities:

- Manafwa and Tororo in Uganda,
- Bungoma West and South, Teso North an South, in Kenya.

After identification of pilot areas, a stage of mobilization and awareness of population will seek to reach community support of the project and ensure land owners or users in the areas will actively respect and contribute to protect the rehabilitation areas.

QUANTITIES

The Riverbank Protection Project is supposed to start with a first phase with duration of 5 years. This is considered as a minimum period where tangible outputs can be expected, given the gradual take off of implementation and the innovative character of suggested measures. Since programs of this kind are generally having an impact growing substantially only after longer period, a donor should preferably be prepared to a longer term commitment.

A tentative estimation of progress in river bank protection over a five years period, shows that a total of over 25 km of river length including several different type of degradation addressed, can be protected on the basis of 2 000 to 6 000 meters each year

One Agroforestry Field Officers would be deployed in 6 districts, to manage the pilot rehabilitation works.

COSTS AND BENEFITS

No quantifiable benefits are expected from this activity.

Expected costs are detailed below.

Activity	Unit	Quantities						Unit Cost ($x'000)	Totals USDx'000					
		year 1	year 2	year 3	year 4	year 5	Total		year 1	year 2	year 3	year 4	year 5	Total
Riverbank protection														
1 Field staff costs														
Project Forestry officers /extension staff 1 per district / 6 districts	pmonth	72.00	60.00	60.00	60.00	60.00	**312.00**	2.00	144.00	120.00	120.00	120.00	120.00	624.00
Subtotal 1									**144.00**	**120.00**	**120.00**	**120.00**	**120.00**	**624.00**
2 Equipment/Material														
Equipement set for staff	unit	6.00					**6.00**	1.20	7.20	0.00	0.00	0.00	0.00	7.20
Subtotal 2									**7.20**	**0.00**	**0.00**	**0.00**	**0.00**	**7.20**
3 Workshops & meetings														
Workshops, meetings and field visits	lumpsum	5	5	5	5	5	**25**	1.75	8.75	8.75	8.75	8.75	8.75	43.75
Subtotal 3									**8.75**	**8.75**	**8.75**	**8.75**	**8.75**	**43.75**
4 Transport & other operation costs														
Transboundary traveling	lumpsum	1	1	1	1	1	**5**	2.00	2.00	2.00	2.00	2.00	2.00	10.00
Subtotal 4									**2.00**	**2.00**	**2.00**	**2.00**	**2.00**	**10.00**
5 Consultancies														
Preliminary survey and implementation plan	pmonth	6	2	2	2	2	**14**	10.00	60.00	20.00	20.00	20.00	20.00	140.00
Subtotal 5									**60.00**	**20.00**	**20.00**	**20.00**	**20.00**	**140.00**
6 Funds and Revolving funds														
Fund for rehabilitation intervention (10 km)	ml	2000	5000	6000	6000	6000	**25,000.00**	0.05	100.00	250.00	300.00	300.00	300.00	1,250.00
fund for editing and dissemination of technical and promotion support material	lumpsum	1.00	1.00	1.00	1.00	1.00	**5.00**	2.50	2.50	2.50	2.50	2.50	2.50	12.50
Subtotal 6									**102.50**	**252.50**	**302.50**	**302.50**	**302.50**	**1,262.50**
Subtotal 1 to 6														**2,087.5**
7 Funds for ESMF														52.19
Subtotal 2: Riverbank protection									**324.5**	**403.3**	**453.3**	**453.3**	**453.3**	**2,139.64**

3.1.5 Sector Project 1E. Promotion of sustainable practices for sand abstraction

EXPECTED OUTPUTS

The sub-project key outputs are the followings:

A. Knowledge on sand abstraction occurrence and current practices and consequences has increased

B. Proposition are made for improvement of countries regulations, based on a preliminary review of sand abstraction legal framework in each country

C. Community awareness and capacities of communities and technical officers towards river basin functioning, sand abstraction practices impacts and sustainable practices; knowledge of laws and capacities towards riverbank protection are increased

TARGET AREAS

Locations of sand abstraction are numerous and occur along main streams throughout the area. Stakeholders have indicated a few locations of highest priority (mainly in Teso district) but a systematic inventory of locations has not been made.

MEANS

A team of 2 specialists will be recruited for an assignment of 2 months (4 person months in total). The team will include

- a lawyer/institutional development specialist.
- an erosion control specialist or hydraulic engineer,

It is recommended to first make a proper assessment of the severity of the problem, current occurrence and practices of sand abstraction. The survey will include the consultation of relevant stakeholders in the districts mostly concerned : Manafwa, Tororo, Bungoma West and South, Teso North and South. These include district staff of NEMA, MOA/MAAIF, District Water Offices, but also institutions distributing sand abstraction permits (district/municipal councils).

Representatives of these institutions will be invited for meetings/workshops to collectively forward locations of importance (including cartographic reference), and discuss possible measures to be taken.

The team will visit sites of importance together with above stakeholders. Interviews will be organized with on-site stakeholders (labourers and/or entrepreneurs, and respective land-owners), to analyze the issue in more detail: awareness of negative impacts, usefulness and acceptance of regulations, options and required inputs to work more environmentally friendly, appreciation and recommendations for alternative income generation.

The team will make recommendations for measures to be taken. These will cover

- technical aspects: feasibility of reinforcement of riverbanks, installation of reinforced sand collection sites, erosion control measures on slopes,
- legislative/institutional aspects: responsibilities, suitability of regulations and system of permits, possibility of enforcement, options of bylaws tailored to specific local conditions, possibility of translocation of sand abstraction to sites with lower erosion risks,
- socio-economic aspects: suitable options for alternative incomes.
- financial aspects: costs of inputs to improve the situation.

The team will document the findings and recommendations and organize a workshop to discuss these with stakeholders.

QUANTITIES

A lump-sum consultancy service

COSTS AND BENEFITS

A total amount of USD 200 000 has been evaluated as appropriate for this sub-project.

No quantifiable benefits are expected from this activity.

3.2 Sector Project 2: Community Based Wetland Management

EXPECTED OUTPUTS

The sub-project key outputs are the followings:

A. Targeted Wetlands Management Units are identified and mapped according to various categories and Wetlands Management Plans are produced for each watershed units

B. Wetlands Management Committees are established and operational for each Wetlands Management Unit

C. FFS are established and operational in each Wetlands Management Unit

D. GIS facilities and training are provided at the district level

E. Extension staff are equipped and trained to organize, facilitate and provide on-going support to operational FFS and apply participatory extension approach for wetlands sustainable wetlands valorization development; Research institutes are identified and involved in specific supportive tasks

F. Local manufacturers and retail sector are able to supply and maintain tools and equipment suitable for new techniques and practices

G. Nurseries are operational and seedlings available for agroforestry

H. Revolving funds / micro-credit mechanisms is established and accessible to farmers for new investment in agriculture, artisanal, eco-tourism activities

I. Farmers adopt and apply promoted new activities, techniques and practices like fish farm integrated units, Fruit orchard, honey…

J. Community-private partnerships for products commercialization (example for honey production) are created and Farmers have access to market for their cash production

K. New Eco-tourism, handicraft production activities and small scaled enterprises are developed in the water shed

L. Knowledge networks for exchanging experiences are established at local and transboundary levels

MEANS

Wetland management is to a large extent synonymous to community development, the more so in areas with permanent wetlands where management (and conservation) measures may constitute the main part of all measures to be taken.

The project will make use of the experience gained in initiating wetland management activities. This specially applies to the Uganda side with its operational administrative structure for wetland management. Preparatory activities have already been carried out for several locations, for example for Sio-Siteko – Sub-project A, and for Popera – Sub-project – H, both of which have also been shortlisted for implementation under the present investment proposal. These areas already have had investment in important socio-economic information, and wetland management plans have been developed, but real implementation is not occurring because of lack of support, information and capacity building. There is now an opportunity to bring these elements. It is also a wise choice to build upon and to take existing work onward, and by this means to limit disruptions caused by an intermittent or unavailable funding.

The sub-project areas listed below have varying extent, ranging between 25 and 305 km2. The larger areas should preferably be divided into logistically manageable portions of about 25-30 km² comparable to the Popera sub-project. This means that project areas may cover 1 to 4 basic wetland management units.

The project will possibly involve 8 districts: Namatumba, Butaleja, Bugiri, Tororo, Busia districts in Uganda; and Busia, Teso South and Samia districts in Kenya.

The 6 main districts affected by the sub-projects, are: Bugiri, Butaleja, Tororo, and Busia districts in Uganda; and Busia, and Teso South districts in Kenya.

Training will be given to staff of the above 8 districts. It is anticipated that the above districts (8 or 6 in number) will appoint 1 coordinating DTO per sub-project.

CMOs will not directly impose institutional arrangements. They will guide discussions wherein communities or interest groups are shown that improved resource management has its implications and requires a certain degree of organization to come to collective decisions and actions. This is for the simple reason that communities and interest groups need to become aware of the fact that the "anarchistic" exploitation of resources practiced so far, is not a sustainable solution. In this way stakeholders will have an important say in the way they organize themselves, which will stimulate the sense of project ownership. The process of institution building will not be a single event, but a continuous process of about 2 to 3 years with possible shifts in emphasis and with an anticipated gradually decreasing intensity.

For other project areas, the CMOs will guide the sensitization and mobilization process from its beginning, in cooperation with the technical officers from the Wetland Department (Uganda) and NEMA (Kenya). For these areas they will organize the baseline surveys or "preliminary resource survey" to take place and initiate the stakeholder consultation and sensitization process. Elements to be included are

- Wetland resources and their estimated value.
- Present utilization and amounts and/or extents.
- Numbers of people are involved, human potential and appropriate Population structure for proposed activities.
- Interested stakeholders.
- Community organization.
- Identification of conflicting interests and opinions to resolve these.

This information is essential for any community development project before any subsequent plan can be formulated and investment allocated. Planning will involve various community meetings to establish mutual agreements. If this is not done properly the project will fail.

A conventional time needed for surveys is usually one month for an area with an extent of about of 25 – 40 km^2. A survey would focus on one village within this area but draw on people in the whole area. Areas and focus villages are identified above for the SMM basin. There are 6 areas and 13 villages identified in the list of sub-projects in Table 1-1, which require surveys. Sio-Siteko and Popera sub-projects already have substantial amounts of information but will require visits for public awareness reminders of the previous work.

Technical aspects will be taken care of by District Technical Officers, who have a basic knowledge of possible measures for improved management and improved livelihoods.

The project will support the production or collection of extension materials for the purpose of knowledge transfer to community level.

For innovative or more advanced measures, technical officers will be trained by a wetland management specialist employed by the project.

The sensitization and mobilization process will finally result in an overall plan per basic wetland management unit. The plans per basic unit will then be aggregated into an overall plan for the sub-project area, from which annual plans will be formulated for implementation. For introduction of specific alternative livelihoods, for example fish pond construction, eco-tourism activities or honey production, a separate plan can be made.

The project will provide the necessary inputs for implementation. Inputs will include planning tools, at community level and at the level of coordinating government institutions (Districts Wetland Departments in Uganda and NEMA in Kenya), and inputs required for installation of improved livelihoods, which cannot be provided locally. For the purpose of increased project ownership, participating communities will as much as possible provide inputs themselves: they would provide manual labour, and will be trained to produce their own planting material for biological measures such as tree production.

Since the type of implementations will much depend on communities' preferences, precise quantification of necessary implementation inputs is not possible. Tentative and flexible budgets will be reserved to facilitate implementation.

For each project area, a training needs assessment will be carried out, covering the various levels of participating stakeholders. On the basis of accumulative needs, a training program will be defined and implemented. Training may include formal training by project specialists or specialists in partner organizations, and on-the-job training for technical officers by project specialists, and for all stakeholders by CMOs. In addition, exchange visits will be organized between sub-projects or with other areas of interest within the SMM basin.

GIS will be an important planning tool and will be given due attention.

TARGET AREAS

The project under the Wetland Management Plan will be concerned with the latter two of the wetland categories described above:

- Category 3 (seasonal floodplain wetlands) provide the best opportunities for wetland development in the form of improved livelihoods, as these are not fully encroached yet;
- Category 4 (permanent wetlands) requires a stronger emphasis on conservation because of its important ecological function in the SMM basin as a whole.

For the investment strategy to be efficiently focused and not ineffectively dissipated too thinly across a wide geographical area, a number of specific locations has been selected for a first implementation phase (of five years). It is anticipated that donors realize the necessity of longer term commitments (of about 10-15 years) as to cover as many of the wetlands in these categories as possible.

QUANTITIES

The Wetland management Plan provides for one project with 8 sub-projects. Selected Sub-project areas are listed in the table below (area A-H).

The proposed sub-project locations have already received some initial management attention or concern, but they do not have all the necessary socio-economic information to formulate a management plan suitable for the specific local circumstances. Before the investment costs of practical interventions can be calculated it will be necessary to obtain this information.

There are in addition many scattered locations of limited extent which justify attention in the course of ongoing routine management.

Area	Name	Main district(s)	Wetland category	Area km²	Villages	Population Affected**	Comments
A	Sio-Siteko	Busia Kenya. Busia Uganda. Samia	Permanent	80	Lumino*, Manango*(Samia) Bulwenge*, Buyadeti*(Busia U) Lwanda*, Muramba*(Busia K).	228,000	Socio-economic survey is available. Stakeholders defined. Trans-boundary.
B	Malaba-Mpologoma	Bugiri Tororo	Permanent	91	Bugobi*, Bubade*, Bugagere*, Kisoro, Wumbwa, Lugulo, Maho, Buwega, Kisoko, Makenya, Budembe,Nakitaka	41,000	Rice incursion. Population expansion. Open water fishing.
C	Kibimba-Namaseri	Bugiri	Permanent	54	Bulugui*, Kayango*, Ruwakiro, Buwafu, Namugange, Bugunda, Butundula, Namwambi, Bulesi, Bugai.	13,700	Rice incursion. Fast population expansion.
D	Nakwera	Bugiri	Seasonal - Permanent	48	Bulanga*, Nakitaka*, Bukubansiri, Bulalo, Kasokwa, Nabiwere, Wanenga.	9,800	Agricultural improvement. Wetland use diversification. Population expansion
E	Iyolwa	Tororo Busia	Seasonal - Permanent	48	Iyolwa*, Bumanda*, Patumbu, Pasimbi, Chawalo-Sirongo, Kayawalo, Gule, Nyamulinde, Nyamera.	15,000	Agricultural improvement. Wetland use diversification
F	Mid-Malaba	Tororo Teso South	Seasonal	68	Paboni*, Kayoro*, Apoli, Ubalyo.	21,300	Agricultural improvement. Wetland use diversification
G	Nagongera-Dumbu	Tororo/Nagongera	Seasonal	40	Nagongera*, Rubuler*, Mikwana-Kijwala, Nyamanda, Wichmana, Mukwana-Moriwe, Mahanga, Awanya, Mukiya, Mifumi, Kisok, Opradamwere.	19,700	Agricultural improvement. Wetland use diversification
H	Popera	Tororo	Seasonal	25	Magola*	8,000	Stakeholders defined. Encroached. To be updated.

Table 3.1: SMM WETLANDS MANAGEMENT SUB-PROJECT AREAS

* Priority Town or Village to start wetland management initiatives within the large areas of interest.

** Potential population which could finally be affected by wetland management in the whole area. The initially affected population may be smaller.

COSTS AND BENEFITS

Stakeholder analysis

Year	Earnings	Costs	Net Benefits
1	5 636	8 844	- 3 208
2	6 849	6 362	488
3	6 849	4 842	2 007
4	10 017	5 106	4 911
5	10 017	5 106	4 911
6	10 017	5 243	4 775
7	10 017	5 106	4 911
8	10 017	5 106	4 911
9	10 017	5 106	4 911
10	10 017	5 106	4 911
11	10 017	5 243	4 775
12	10 017	5 106	4 911
13	10 017	5 106	4 911
14	10 017	5 106	4 911
15	10 017	5 106	4 911
16	10 017	5 243	4 775
17	10 017	5 106	4 911
18	10 017	5 106	4 911
19	10 017	5 106	4 911
20	10 017	5 106	4 911
Net Present Value (NPV)			***23 711 €***

Project analysis

Year	Earnings	Costs	Net Benefits
1	- 3 208	1 696,50	- 4 905
2	488	1 279,90	- 792
3	2 007	1 181,90	825
4	4 911	1 209,50	3 702
5	4 911	1 175,90	3 735
6	4 775		4 775
7	4 911		4 911
8	4 911		4 911
9	4 911		4 911
10	4 911		4 911
11	4 775		4 775
12	4 911		4 911
13	4 911		4 911
14	4 911		4 911
15	4 911		4 911
16	4 775		4 775
17	4 911		4 911
18	4 911		4 911
19	4 911		4 911
20	4 911		4 911
Net Present Value (NPV)			***18 899 €***
Internal Rate of Return (IRR)			***42%***

Activity	Unit	Quantities						Unit Cost ($x'000)	Totals USDx'000					
		year 1	year 2	year 3	year 4	year 5	Total		year 1	year 2	year 3	year 4	year 5	Total
Wetlands Management Project														
1 WM Field staff = current cost														
Project officers /extension staff 8 persons = 1 per district	pmonth	96.00	96.00	96.00	96.00	96.00	**480.00**	2.00	192.00	192.00	192.00	192.00	192.00	960.00
Community Mobilization facilitators 16 persons = 2 per district	pmonth	192.00	192.00	192.00	192.00	192.00	**960.00**	2.00	384.00	384.00	384.00	384.00	384.00	1,920.00
Advanced farmers = 1 per 1 unit 10% time	pmonth	264.00	264.00	264.00	264.00	264.00	**1,320.00**	0.10	26.40	26.40	26.40	26.40	26.40	132.00
Subtotal 1									**602.40**	**602.40**	**602.40**	**602.40**	**602.40**	**3,012.00**
2 Equipment/Material														
equipement set for staff	unit	24.00					**24.00**	1.20	28.80	0.00	0.00	0.00	0.00	28.80
upgrading district division GIS facilities (computer, software, digitizer table,	Lumpsum	8.00					**8.00**	2.50	20.00	0.00	0.00	0.00	0.00	20.00
subsidiary fund for committee equipement	Lumpsum	22.00	240.00	240.00	240.00	240.00	**982.00**	1.00	22.00	240.00	240.00	240.00	240.00	982.00
Motorbikes	unit	24.00			8.00		**32.00**	3.00	72.00	0.00	0.00	24.00	0.00	96.00
Subtotal 2									**142.80**	**240.00**	**240.00**	**264.00**	**240.00**	**1,126.80**
3 Workshops & meetings														
Workshops and meetings	lumpsum	6	6	6	6	6	**30**	1.75	10.50	10.50	10.50	10.50	10.50	52.50
farmers visits costs by location (10 persons form 6 locations during 3 days/year)	lumpsum	6	6	6	6	6	**30**	7.50	45.00	45.00	45.00	45.00	45.00	225.00
Subtotal 3									**55.50**	**55.50**	**55.50**	**55.50**	**55.50**	**277.50**
4 Transport & other operation costs														
Transboundary traveling	lumpsum	6	6	6	6	6	**30**	3.00	18.00	18.00	18.00	18.00	18.00	90.00
Motorbikes operating costs (8 motorbikes)	month	576	0	0	192	0	**768**	0.05	28.80	0.00	0.00	9.60	0.00	38.40
Subtotal 4									**46.80**	**18.00**	**18.00**	**27.60**	**18.00**	**128.40**
5 Consultancies														
Unspecified consultancies (international) (eco-tourism development feasibility	pmonth	3	2	1	1	1	**8**	17.00	51.00	34.00	17.00	17.00	17.00	136.00
Unspecified consultancies (national)	pmonth	3	3	2	2	2	**12**	6.00	18.00	18.00	12.00	12.00	12.00	72.00
Community Mobilization trainer/adviser	pmonth	3	2	1			**6**	6.00	18.00	12.00	6.00	0.00	0.00	36.00
Training district officers for GIS / data base (international expert)	pmonth	3	3					17.00	51.00	51.00	0.00	0.00	0.00	102.00
Training extension trainer:adviser	pmonth	3	3				**6.00**	6.00	18.00	18.00	0.00	0.00	0.00	36.00
Preliminary survey and implementation plan	lumpsum	6					**6**	77.00	462.00	0.00	0.00	0.00	0.00	462.00
Subtotal 5									**618.00**	**133.00**	**35.00**	**29.00**	**29.00**	**844.00**
6 Revolving Funds														
Fund to support Fish Farm Integrated units 1per year/unit	lumpsum	22.00	22.00	22.00	22.00	22.00	**110.00**	10.50	231.00	231.00	231.00	231.00	231.00	1,155.00
Subtotal 6									**231.00**	**231.00**	**231.00**	**231.00**	**231.00**	**1,155.00**
Subtotal 1 to 6														**6,543.70**
7 Funds for ESMF														**163.59**
Subtotal Wetlands									**1,696.5**	**1,279.9**	**1,181.9**	**1,209.5**	**1,175.9**	**6,707.29**

3.3 Sector Project 3: Storm Water Drainage and Solid Waste Management in Bungoma and Lwakhakha

The elements for this project have been submitted earlier, and are detailed in Annexes 3A and 3B.

For the Solid Waste Management aspect, costs of medium and long term operation have been elaborated, although they are not included in the present 5-year expenditure program. Only the short-term costs are included.

	Project Cost component (USD)	Short Term 2012 - 2016	Medium Term 2017 -2021	Long Term 2022-2032
Bungoma	Capital Cost	1,595,206	543,294	1,812,206
	O&M	495,059	555,765	720,941
Lwakhakha U	Capital Cost	573,378	214,200	642,083
	O&M	163,333	199,333	372,667
Lwakhakha K	Capital Cost	166,188	90,682	200,988
	O&M	192,471	232,235	438,353
Grand total		**3 185 635**		

For Storm Water Drainage, Lwakhakha has been considered as one unit of both sides of the border for operative reasons:

	Description	Amount (US$)
Bungoma	Surveys and Construction	2,197,077
	Project Management and Supervision (20%)	439,416
	Contingencies (15%)	329,562
	Sub-total	**2,966,055**
Lwakhakha	Surveys and Construction	179,198
	Project Management and Supervision (20%)	35,839
	Contingencies (15%)	26,880
	Sub-total	**241,917**
Grand Total		**3 207 972**

Note that the costs above do not include the cost for Environmental and Social Management, estimated at 2.5% of the total, which must be added to the amounts indicated.

3.4 Project Management

The detailed costs of Project Management have been evaluated and are presented in the Table below.

Activity	Unit	Quantities						Unit Cost	Totals USDx'000					
		year 1	year 2	year 3	year 4	year 5	Total	($x'000)	year 1	year 2	year 3	year 4	year 5	Total
Project Management														
1. PMU Staff.														
1.1 Professional staff.														
Project manager.	pmonth	12	12	12	12	12	**60**	6.00	72.00	72.00	72.00	72.00	72.00	360.00
Financial Manager	pmonth	12	12	12	12	12	**60**	4.00	48.00	48.00	48.00	48.00	48.00	240.00
Procurement expert	pmonth	12	12	12	12	12	**60**	4.00	48.00	48.00	48.00	48.00	48.00	240.00
M&E Specialist	pmonth	12	12	12	12	12	**60**	4.00	48.00	48.00	48.00	48.00	48.00	240.00
GIS Specialist	pmonth	12	12	12	12	12	**60**	1.00	12.00	12.00	12.00	12.00	12.00	60.00
Subtotal 1.1									**228.0**	**228.0**	**228.0**	**228.0**	**228.0**	**1,140.0**
1.2 Administrative staff.														
Administrative assistant.	pmonth	12	12	12	12	12	**60**	0.50	6.00	6.00	6.00	6.00	6.00	30.00
Accountant.	pmonth	12	12	12	12	12	**60**	0.50	6.00	6.00	6.00	6.00	6.00	30.00
Secretary (2 persons).	pmonth	24	24	24	24	24	**120**	0.50	12.00	12.00	12.00	12.00	12.00	60.00
Driver (2 persons).	pmonth	24	24	24	24	24	**120**	0.50	12.00	12.00	12.00	12.00	12.00	60.00
Subtotal 1.2									**36.0**	**36.0**	**36.0**	**36.0**	**36.0**	**180.0**
2. Operating costs.														
2.1 Office														
Office operating expenses.	month	12	12	12	12	12	**60**	1.0	12.00	12.00	12.00	12.00	12.00	60.00
Subtotal 2.1									**12.0**	**12.0**	**12.0**	**12.0**	**12.0**	**60.0**
2.2 Transport														
vehicle operating costs.	month	36	36	36	36	36	**180**	0.8	28.80	28.80	28.80	28.80	28.80	144.00
Subtotal 2.2									**28.8**	**28.8**	**28.8**	**28.8**	**28.8**	**144.0**
3. Coordination offices Staff.														
3.1 Professional staff.														
Coordinator (2 persons: 1 wetlands /1 CRMP)	pmonth	24	24	24	24	24	**120**	2.0	48.00	48.00	48.00	48.00	48.00	240.00
Liaison officer (2 persons)	pmonth	24	24	24	24	24	**120**	2.0	48.00	48.00	48.00	48.00	48.00	240.00
Accountant (2 persons)	pmonth	12	12	12	12	12	**60**	0.5	6.00	6.00	6.00	6.00	6.00	30.00
GIS Specialist (2 persons, 1/2time)	pmonth	12	12	12	12	12	**60**	1.0	12.00	12.00	12.00	12.00	12.00	60.00
Subtotal 1.1									**114.00**	**114.00**	**114.00**	**114.00**	**114.00**	**570.00**
3.2 Administrative staff.														
Accountant (2 persons)	pmonth	12	12	12	12	12	**60**	0.5	6.00	6.00	6.00	6.00	6.00	30.00
Secretary (2 persons).	pmonth	24	24	24	24	24	**120**	0.5	12.00	12.00	12.00	12.00	12.00	60.00
Driver (2 persons).	pmonth	24	24	24	24	24	**120**	0.5	12.00	12.00	12.00	12.00	12.00	60.00
Subtotal 3.2									**30.00**	**30.00**	**30.00**	**30.00**	**30.00**	**150.00**
4. Coordination office Operating costs.														
4.1 coordination Offices														
Office operating expenses (2 offices)	month	24	24	24	24	24	**120**	0.1	2.40	2.40	2.40	2.40	2.40	12.00
Subtotal 4.1									**2.40**	**2.40**	**2.40**	**2.40**	**2.40**	**12.00**
4.2 Transport														
Vehicle operating costs (2 vehicles)	month	72	72	72	72	72	**360**	0.8	57.60	57.60	57.60	57.60	57.60	288.00
Subtotal 4.2: Coordination offices operating costs									**57.60**	**57.60**	**57.60**	**57.60**	**57.60**	**288.00**
5. Equipment for the PMU & coordination offices														
Construction/rehabilitation of office space.	office	3	-	-	-	-	**3**	10.0	30.00	0.00	0.00	0.00	0.00	30.00
office equipement (cell.phone, computer, printer…) and furniture	set	20	-	-	-	-	**20**	1.5	30.00	0.00	0.00	0.00	0.00	30.00
Training extension material	Lupsum	5	10	10	10	10	**45**	1.0	5.00	10.00	10.00	10.00	10.00	45.00
vehicle.(3 PMU + 3 per coordination office)	4x4	9	-	-	-	-	**9**	30.0	270.00	0.00	0.00	0.00	0.00	270.00
Subtotal 5									**335.0**	**10.0**	**10.0**	**10.0**	**10.0**	**375.0**
Total Project Management									**843.8**	**518.8**	**518.8**	**518.8**	**518.8**	**2,919.0**

CHAPTER 4.Synthesis of project costs

The tables below present the synthesis of the Integrated Watershed Management Project costs broken down under different angle:

Breakdown by Component

Project Component	Cost
Watershed Conservation	12,312.62
Income Generation	7,716.52
Watershed Management	10,335.49
Urban Infrastructure	6,394.00
Project Management	2,919.00
	39,677.62

Breakdown of costs by type of expenditure

Expenditure Account	Total Cost US$000's
1 Investment Costs	
Equipment/Material	3,901
Funds for project implementation	13,157
Revolving funds	1,921
Funds for ESMF	892
Consultancies	1,879
Workshops & meetings	1,305
Total Investment Costs	**23,053**
2 Recurrent Costs	
Field staff costs	15,243
Transport & other operation costs	1,381
Total Recurrent Costs	**16,624**
A. TOTAL BASE COST	**39,678**

Breakdown of costs by projects and sub-projects

Cost Breakdown into sector projects (in USD '000)

Afforestation	7,757.46
Soil & Water conservation/ Agroforestry	8,793.53
Conservation Agriculture	4,606.86
River bank protection	2,139.64
Sand extraction	200.00
Wetland management	6,707.29
Storm water drainage	3,288.20
Solid waste management	3,265.65
Project management	2,919.00
Grand Total	**39,677.62**