New Partnership for
Africa's Development (NEPAD)

Comprehensive Africa Agriculture
Development Programme (CAADP)

Food and Agriculture Organization
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Investment Centre Division

GOVERNMENT OF THE REPUBLIC OF KENYA

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume III of IV

BANKABLE INVESTMENT PROJECT PROFILE

Integrated Land and Water Resources Management

December 2004

KENYA: Support to NEPAD–CAADP Implementation

Volume I: National Medium–Term Investment Programme (NMTIP)

Bankable Investment Project Profiles (BIPPs)

Volume II: Agriculture Focused Rural Finance Project

Volume III: Integrated Land and Water Resources Management

Volume IV: Disease Control and Facilitation of Livestock Commodities Marketing

NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Kenya

Sector of Activities: Water and Land Resources

Proposed Project Name: **Integrated Land and Water Resources Management**

Project Location: Central and Eastern Kenya

Duration of Project: 6 years

Estimated Cost:
Foreign Exchange ..... US$8.97 million
Local Cost ..... US$48.81 million
Total ..... US$57.78 million

Suggested Financing:

Source	***US$ million***	***% of total***
Government	15.0	26%
Financing institution(s)	40.0	69%
Beneficiaries	3.0	5%
Private sector	0.0	0%
Total	***58.0***	***100%***

KENYA:

NEPAD–CAADP Bankable Investment Project Profile

"Integrated Land and Water Resources Management (ILWRM)"

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Abbreviations

ADB	African Development Bank
ASAL	Arid and Semi–arid Land
CAADP	Comprehensive Africa Agricultural Development Programme
CBO	Community Based Organisation
CBS	Central Bureau of Statistics
DSC	District Steering Committee
ENNDP	Ewaso Ng'iro North Development Project
EUREGAP	European Retail Protocol for Good Agricultural Practices
FBO	Faith Based Organisation
GDP	Gross Domestic Product
GEF	Global Environmental Fund
HDI	Human Development Index
HIV/AIDS	Human Immuno–Deficiency Virus/Acquired Immune Deficiency Syndrome
IFAD	International Fund for Agriculture and Development
ITDG	Intermediate Technology Development Group
ILWRM	Integrated Land and Water Resource Management
KAPP	Kenya Agricultural Productivity Project
KARI	Kenya Agricultural Research Institute
LDC	Location Development Committee
M&E	Monitoring and Evaluation
MOA	Ministry of Agriculture
MOCDM	Ministry of Cooperative Development and Marketing
MOE	Ministry of Energy
MOENRW	Ministry of Environment, Natural Resources and Wildlife
MOLFD	Ministry of Livestock and Fisheries Development
MOWRMD	Ministry of Water Resources Management and Development
NEMA	National Environmental Monitoring Authority
NEPAD	New Partnership for Africa's Development
NGO	Non–Governmental Organisation
NIB	National Irrigation Board
NMTIP	National Medium Term Investment Program
NSMC	National Steering and Management Committee
PCO	Project Coordination Office
PMO	Project Management Office
PRSP	Poverty Reduction Strategy Paper 2001–2004
SPFS	Special Programme for Food Security
VDC	Village Development Committee
WCAC	Water Catchment Advisory Committee
WRMA	Water Resources Management Authority
WSB	Water Services Board
WSRB	Water Services Regulatory Board
WUA	Water Users Association

I. PROJECT BACKGROUND

A. Project Origin

I.1. *Integrated Land and Water Resources Management* (ILWRM) for improved agricultural production is a new project which has been conceptualised from CAADP list of priorities validated at the national workshop organised to review the Kenya's *National Medium–Term Investment Programme* (NMTIP). The project has been discussed with the officials in Ministry of Agriculture (MOA), Ministry of Water Resources Management and Development (MOWRMD), Ministry of Energy (MOE), and Ministry of Environment and Natural Resources (MOENRW), although not exhaustively. Because of dispersion of responsibilities in the government, the project will involve several ministries and departments. There will be a need therefore to anchor the project in one ministry or department for accountability and implementation. There are also a number of donors involved in the sector that are supporting small water projects, agricultural productivity improvement schemes, conservation and other related activities. The activities of these donors will need coordination and possibly collaboration in order to make it possible to exploit prevailing synergies, permit scaling up of on–going projects and to efficiently use human resource capacity for implementation and supervision of projects. A coordinated approach from donors and the government would enable the scarce financial resources available to be applied on various needs of the people in an integrated fashion and therefore have a more successful and durable impact on the development of the area than several single donor projects.

B. General Information

I.2. Kenya's economy is highly dependent on agriculture. The sector contributes directly 26% of GDP and 60% of the export earnings. Moreover, through links with manufacturing, distribution and service–related sectors, agriculture indirectly contributes a further 27% of the country's GDP. Agriculture is also important because it is the main activity in the rural areas where over 80% of the population live. But even in the urban areas, agricultural related activities provide the main source of livelihoods. One other reason for giving priority to agriculture is that the majority of the Kenyan population is food insecure. Estimates available indicate that about 50.6% of the population lacks access to adequate food and, even the little they get, is of poor quality. The incidence and prevalence of food insecurity is more severe in arid and semi–arid areas due to lack of water. For their survival, the food–poor depend on the relief food provided by the government and non–governmental organizations (NGOs). It is estimated that the government spends around US$40–65 million annually on famine relief; and the figure is even much higher when famine relief support by NGOs is taken into account.

I.3. These factors, therefore, suggest that for any strategy to address the question of poverty and food insecurity successfully, it must embrace broad–based growth and development of agriculture and by extension development of rural Kenya. It must involve activities aimed at improving agricultural and livestock production and real farm incomes, and at ensuring the availability of, and access to, food. Despite its relative importance to Kenya's economy, agricultural sector growth has been declining from about 6.0% in the 1960–80s to an annual average of about 1.3% in 1990–2000. As a result, Kenya's income per capita declined from about US$428 to around US$239 during the period. Many factors have contributed to the decline of the agricultural sector, of which the most important for this exercise is land scarcity and unpredictable weather.

I.4. Kenya has an area of about 587,000 km^2, out of which 11,000 km^2 is water. Of the remaining 576,000 km^2 of landmass, only 16% is of high and medium agricultural potential with adequate and

reliable rainfall. This high and medium potential arable land is dominated by subsistence and commercial agriculture. The remaining 84% of Kenya is arid and semi–arid and not suitable for rain–fed farming due to low and erratic rainfall.

I.5. On the basis of rainfall, the country can be divided into three main zones. First is the ***high rainfall zone***, which receives more than 1,000 mm of rainfall annually and occupies less than 20% of the productive agricultural land and carry approximately 50% of the country's population. Most of the food and cash crops as well as livestock are produced in this zone under semi–intensive and intensive systems.

I.6. Second is the ***medium rainfall zone***. This zone receives between 750–1,000 mm of rainfall annually and occupies between 30%–35% of the country's land area. It is home for about 30% of the population. There is significant immigration of the population from the densely populated high rainfall zone to the medium rainfall zone. Consequently, there has been substantial environmental degradation in the medium and high rainfall zones as a result of population pressure. This manifests in the destruction of catchment areas, land, water and air pollution which has led to regular flooding of some areas, land slides, siltation of rivers, and natural habitat for wildlife and human health problems. Third is the ***low rainfall zone***, which receives 200–350 mm of rainfall annually and is home for about 20% of the population, 80% of the country's livestock and 65% of the country's wildlife.

I.7. Most farming in Kenya is rain–fed, and, therefore, is susceptible to weather fluctuations. Over the last three decades the frequency of droughts and floods has increased, resulting in crop failures and loss of livestock. Furthermore, with increasing land degradation, land resilience has been reduced and the effects of drought and floods exacerbated. Kenya has a significant potential for irrigation that remains unexploited. Out of 540,000 ha of irrigable land, less than 90,000 ha have been irrigated. The development of irrigation is hindered by a number of constraints such as low utilization of water, efficient technologies, sloth in the allocation of permits for the use of water, poor management of irrigation schemes under the government, weather changes and unpredictability that complicates irrigation planning, uncontrolled exploitation of groundwater that leads to a drop in the water table and an increase in extraction costs, and low participation by producers in the management of irrigation schemes. Irrigation can play an important role in increasing Kenya's agricultural productivity per unit land, expand arable land and stabilize agricultural production in times of adverse weather conditions.

I.8. Kenya's agriculture is dominated by small–scale farmers mainly in the high potential areas. The small–scale farming sub–sector accounts for 75% of the total agricultural output and 70% of marketed agricultural produce. Small–scale farmers produce over 70% of maize, 65% of coffee, 50% of tea, 80% of milk, 85% of fish and 70% of beef and related produce. Production is carried out on farms averaging 2–3 hectares mainly for subsistence and commercial purposes. Increase in productivity, therefore, will need to take place in the smallholder sub–sector and will entail providing farmers with more reliable sources of water for farming and human consumption.

I.9. The implementation of ILWRM is likely to involve several government, parastatal and private institutions involved in water development, distribution and management. The key institutions are MOWRMD, *National Irrigation Board* (NIB), local governments, and cooperatives. The Water Act 2002 is in the early stages of being implemented and will have a significant bearing on the implementation of ILWRM project. The Act provides for creation of new institutions and redefining the roles of existing ones. The key provisions are:

- Creation of a ***Water Resources Management Authority (WRMA)*** which will be responsible for development of principles, procedures and guidelines for allocation of

water resources and issuance of water permits. The Director of Water will therefore remain to handle mainly policy issues while technical functions and most of the staff will transfer to WRMA;

- ***Water Services Regulatory Board (WSRB)*** to be responsible for licensing all operations relating to water supply and distribution services in Kenya. The WSRB will also be required to develop a national water supply services strategy which among other things should include an investment programme showing how the Kenya nation is to be served with water. The functions of WRMA and WSRB will in the course of implementation need to be harmonised to remove overlaps;

- ***Water Services Boards (WSBs)*** will be responsible for provision of water to consumers in a local area through approved service providers;

- ***Water Catchment Advisory Committees (WCACs)*** will be advising WRMA on water resources conservation, use and apportionment and grant, variation or cancellation of permits in their areas of jurisdiction.

II. PROJECT AREA

II.1. The proposed project is intended to cover Tana, Athi and part of Ewaso Ng'iro rivers catchment with an area of about 53,500 km^2. About 48% of the area is accounted for by Isiolo District which in terms of population accounted for only 2.1%. The area is located to the east of the Great Rift Valley. It will cover the 12 districts adjacent to Mt Kenya, Aberdare and Ngong Hills which cover two broad ecological zones. The first zone covers the highlands above 1,500 m above sea level. The second zone covers mainly the lowlands. These areas have been selected for several reasons. First, the highlands are the water catchments for Tana River which is Kenya's main source of hydroelectric power and supply of water for agricultural, industrial and domestic use including Nairobi and other major towns. The area is also home to about 35% of Kenya's population with densities reaching about 1,000 per km^2 in some areas. Most of Kenya's agricultural exports of coffee, tea, and horticultural crops are grown in this area. Due to population pressure and absence of a land use policy land in the area has been over–used resulting in destruction of natural habitats, cultivation of slopy areas, river siltation and pollution. The lowlands were selected because they suffer from frequent and prolonged droughts yet with water they have ideal temperatures for growing crops. The fragile soils in the lowlands also make them prone to erosion.

II.2. ***Topography, Climate and Soils.*** Land elevation in the highlands rises from around 1,500 m asl to 3,000 m asl. The area is dissected by many rivers and deep valleys which make it prone to soil erosion. The main rivers are Tana and Athi in the east and south respectively while there is Ewaso Ng'iro in the north. All the rivers eventually drain to the Indian Ocean. Rainfall in this area is bimodal with one peak occurring April–May and the other October–November periods. Precipitation varies considerably within the area from about 750 to 1,000 mm. It is a function of relief, generally declining from the high to lower altitudes. Temperatures are generally moderate, but vary considerably during the year depending on elevation. This results in notable variations in agroclimatic zones. Consequently, crop species and varieties which grow in the area vary accordingly. The soil types found are mainly well drained red volcanic in nature. Soil erosion and declining soil fertility are manifest in the high altitude areas. Deforestation is rampant due to acute exploitation of trees for building and fuel–wood.

II.3. The lowlands comprise the areas below 1,500 m asl. These include the Yatta Plateau, Kapiti and Mwea plains in the south and Ewaso Ng'iro basin in the north. Other areas are generally lowlands with undulating hills. The area has sandy soils interspersed with pockets of black cotton soils and stone outcrops. Rainfall pattern is similar to that of highland areas although considerably lower and more erratic. Precipitation in the zone varies from 200 to 350 mm. As a result vegetation is mainly woody savannah. Most trees have been cut down for fuel wood — a process that is still going on.

II.4. ***Population.*** According to the Population Census of 1999, there were about 4.8 million people in about 1,089,000 households or an average of about 4.42 persons per household in the area. The highlands hosted 3.7 million people and the balance of 2.1 million in the lowlands. The project area comprises some of the most densely populated areas in Kenya as well as the least populated. Population density varies widely from 4 in Isiolo to 381 persons per km^2 in Embu, although it reaches about 1,000 persons in some parts of the highlands. The youth, i.e. persons under the age of 19 years, constitutes the bulk of population at 55%. Sex ratio is normal like other parts of Kenya at about 1.01% except in Isiolo where it is 0.97% perhaps due to refugee situation.

II.5. ***Agriculture.*** Production of agricultural crops varies according to agro–ecological zone. Agriculture is predominantly small–scale, mainly in the high potential areas. The small–scale farming sub–sector accounts for 75% of the total agricultural output and 70% of marketed agricultural produce. Small–scale farmers produce over 70% of maize, 65% of coffee, 50% of tea, 80% of milk, and 70% of beef and related produce. Production is carried out on farms averaging 2–3 ha mainly for subsistence and commercial purposes. Large–scale farming is practised on farms averaging about 50 ha and accounts for 30% of marketed agricultural produce. In the highlands, large–scale farmers are mainly involved in the growing of crops such as tea, coffee, horticulture, as well as keeping of dairy cattle. Yields are much higher in the large scale farms than in the small scale farms because of sustained application of quality inputs, better farm management and more importantly capacity to mitigate effects of erratic weather through stable water sources. In the lowlands, livestock keeping for meat is predominant. Small–scale farmers also engage in growing of subsistence crops. In most of the times, these farmers are unable to produce enough food for themselves and government is frequently called upon to provide famine relief food. In the recent period, large–scale farmers have diversified into horticultural crops production. This has however required significant investments in water supplies among other infrastructure. The warm weather has favoured such activity.

II.6. ***Infrastructure.*** Rural feeder roads are poor and virtually impassable in the wet season. Electricity for domestic and industrial use is available for very few households.

II.7. ***Technical Skills.*** People generally lack the skills required for farm production especially with regard to water and soil conservation, construction of dams, pan, afforestation and irrigation are limited.

II.8. ***Social Setting.*** The people in this area comprise two main groups each with fairly common anthropological, ethnic, cultural and linguistic characteristics. The first group are Bantu speaking traditionally agriculturists around Mt. Kenya. The population is mainly rural occupied mainly in subsistence production. The second group comprise the Somali speaking nomadic pastoralists in the Ewaso Ng'iro basin.

II.9. ***Local Institutions.*** The *District Development Strategy* that Kenya implemented in the 1980's adopted existing administration organisation structures that rise from village to local, divisional and district level. Although not very successful in fostering development in the past, these structures have remained in place. With the planned devolution of power from the government to the people, these local institutions will become more relevant to development of the rural areas, particularly when they

become legally empowered through the proposed amendments to the Constitution of Kenya. Already, these local institutions have become entry points for community led development programs. The participatory approach to development has proved useful in mobilising local resources and enhancing ownership of projects which are necessary for improving prospects for sustainability.

II.10. The *Village Development Committees* (VDC) will be lowest administrative level to initiate proposals or receive proposals from any group of organised farmers. Members of the VDCs would normally include Assistant Chief of the particular village as ex–officio member, NGOs representative, an extension services officer, a councillor of the area, religious leaders and prominent farmers or businessmen. The *Location Development Committees* (LDCs) consist of the Chief of the location, extension agents, local councillors, and service providers in the area. The *District Steering Committees* (DSCs) would normally be sub–committees of the *District Development Committee*. Members of DSCs include representatives of line ministries, local Members of Parliament, prominent farmers and businessmen.

III. PROJECT RATIONALE

III.1. Small scale farmers are the pillars of Kenya's agriculture. They produce about 70% of marketed agricultural production. With agriculture contributing nearly 50% of Kenya's GDP, it is clear that the growth of the economy as a whole is directly linked to the performance of the small scale producers. Small scale farmers also produce most of food requirements in the country. In the project area, small scale farmers are predominant. Their contribution to the food basket for the area and the country is therefore even higher. This means that measures aimed at improving the income of small scale producers will simultaneously address the food insecurity situation in the country.

III.2. Several factors have hindered growth of agricultural production. The government has through the Strategy for Revitalising Agriculture initiated a policy framework to facilitate integrated interventions and investments in the sector. The World Bank through KAPP is addressing the issue of research and technology transfer; IFAD has three projects in the area: the *Mt Kenya East Pilot Project for Natural Resources Management*; the *Eastern Province Horticulture and Traditional Food Crops Project*; and *Central Kenya Dry Areas Smallholder and Community Development Project*; and the African Development Bank (ADB) through the *Ewaso Ng'iro North Development Project* (ENNDP) is also active in the area. The focus of the ENNDP is integrated water resources development and conservation which fits perfectly with the objectives of this project. There are also several NGOs operating in the area with the objective of improving small scale production and other social objectives such as HIV/AIDS, etc. The government is also reviewing the regulatory framework for cooperative marketing in order to improve governance.

III.3. The initiatives by both the government, CBOs, FBOs and NGOs to raise agricultural production are not able to reach their full potential because of erratic rainfall. Inadequate and erratic rainfall not only reduces production directly, but also makes production planning difficult particularly in the drier lowlands. But even in the highlands where rainfall is more plentiful, water for both human and animal production is not easily accessible. With the exception of areas where piped water has been supplied, an average household in the highlands travels about 1–2 km to the nearest water source. In the drier lowlands, the distance may be as long as 10 km and considerably longer during the dry spells. Consequently, considerable time particularly by women and children is lost in efforts to draw water. The lost time would be used for engagement in more productive activities. Lack or inadequate supply of water also constrains development of off–farm activities. It is for this reason that reliable supply of water is critical to growth of agricultural production and food security. The use of irrigation will boost

production and impact on food supplies and incomes positively in the local area and the entire economy.

III.4. Many of the initiatives that are currently being implemented in the area to supply water to households focus mainly on extraction of existing surface and underground water resources. While that approach is likely to bring some temporary increase in production, it is not sustainable in the long–term for a number of reasons which include:

- Conflicts will eventually emerge between various users. These user conflicts would include upstream and downstream users; rural and urban; agricultural/domestic use versus power generation;
- Supplies of water would eventually dwindle as catchments are degraded.

III.5. By emphasising water harvesting this project differs considerably from the conventional programmes that focus on extracting existing water supplies to support agricultural production. The project looks at the overall long–term sustainability of agricultural development. For example, to avoid conflicts cited above the project proposes to support the formation and capacity building of *Water Users Associations* (WUAs) and WCACs in accordance with the Water Act.

III.6. ***Strategic Importance.*** The project area is of strategic importance to the nation. It is the catchment area for the water that is used to generate nearly 70% of Kenya's electric power at present. About 50% of Kenya's population that reside on the east of the Great Rift Valley is dependent on this water catchment for human use and agriculture. Because of population pressure and absence of a land use policy, the land and water resources in the area are highly degraded through cultivation of steep hillsides, deforestation, overgrazing and application of chemical farm inputs. As a result the water retention capacity of the soils in the area has been reduced and the rain that falls quickly disappears through evaporation and run–off carrying with it nutrients and on–farm applications of chemical inputs. Efforts to increase productivity at farm level must therefore encompass measures to promote and restore environmental sustainability.

III.7. ***Project Alternatives.*** The project may be undertaken as a standalone or be linked to other on–going projects in the area or be cross–referenced with others in the country with similar objectives. For a number of reasons it is recommended that the project be linked to other on–going projects in the area:

- Effectiveness in the use of human and financial resources capacity;
- Opportunities for scaling up successful on–going projects;
- Benefit from experience and lessons learnt in other projects and hence avoid new start–up errors;
- Avoid farmer fatigue by using established social and administrative organisation systems;
- Quick start–up.

IV. PROJECT OBJECTIVES

IV.1. The primary objective of the project is to restore agricultural growth and food security by improving the productivity and sustainability of land use systems in selected watersheds of the Tana, Athi and Ewaso Ng'iro river basins. This objective will be achieved through a number of activities that reduce reliance on rain–fed agriculture and promote sustainable water management and land–use practises.. In this connection, the project will:

- improve the capacity of local communities and institutions to identify, formulate and implement sustainable land and water management activities (including both on– and off–farm land use planning) capturing local and global environmental benefits;
- promote water harvesting, storage and distribution for domestic use and for agricultural production through construction of small dams along the main river tributaries, development of water pans, roof catchments, and sand dams;
- support on– and off–farm conservation strategies by rehabilitating degraded lands through interventions aimed at controlling soil erosion, improving soil fertility, adoption of appropriate agricultural practices, agroforestry, and introduction of value–added cropping systems.

IV.2. The secondary objective of the project is to diversify income generating activities by creating enabling environment for new investments in on– and off–farm agro–processing, commercial and industrial activities and tourism. A key constraint to rural development is lack of power or the high cost of its delivery to where needed from the current national grid. The proposed construction of dams along the river tributaries will in addition to storing water for domestic and agricultural production, further be used to generate power locally where technically feasible. The dams will also help to regulate river regimes in order to eliminate the frequent damage to crops and property caused by flooding.

IV.3. ***National and Global Environmental Objective.*** Although the focus of the project is basically local benefits, its implementation will also confer environmental benefits at both national and global levels. These benefits include:

- reduced land degradation;
- reduced greenhouse gas accumulation in the atmosphere;
- improved on–and off–farm biodiversity;
- decreased soil erosion in watersheds that feed into the Tana, Athi and Ewaso Ng'iro river basins; and
- reduce pollution of rivers and eventually the ocean through adoption of eco–friendly farming practices in the watersheds will benefit the entire world.

V. PROJECT DESCRIPTION

A. Project Outline

V.1. The project will have three main phases. Phase I will be preparatory stage in which baseline information is collected to help in identifying likely interventions and key data for monitoring and evaluation. The second stage will entail identification of project investments and activities for implementation by communities and the government. The final stage entails handing over of the projects management to the communities. The project will have four main components as indicated below.

B. Project Components

***Component 1:* Capacity Building**

V.2. This component will focus on capacity building at three levels i.e. government, local authorities/governments, and at community level:

V.3. ***Sub–component 1.1: Strengthening the Capacity of the Government*** (which includes WRMA,WRAB and other national institutions proposed in the Water Act 2002) to collect and analyse data for monitoring siltation, water quality and (river) flows: This will be in form of training relevant government officials to collect the relevant data as well as to develop and implement a database. Provision of equipment for both data collection, analysis and maintenance of the data base will be provided. The project area suffers considerable soil erosion and infiltration of agro–chemicals into rivers. In order to determine whether the contemplated conservation interventions will have the desired impact, the project will strengthen government capacity to monitor sediment loads and agro–chemical pollution at various predetermined points along the river courses. This may be in form of laboratory testing equipment or training of staff in the relevant field. River flows in the area also suffer considerable variation depending on weather conditions which could be exacerbated by increased project abstraction activities. Regular monitoring of river discharges and rationing will be needed to avoid conflicts between upstream and downstream users.

V.4. Since the project will be largely community driven, it will also be advisable to provide incentives for local communities to participate in managing and monitoring of the river flows and water quality. This could be achieved by disclosing to them the results of the water analysis and/or encouraging some community members through exemptions or reduced water tariffs to be collecting samples of water for analysis. This will have the advantage of reducing costs of collecting samples by the government and serve as a practical education to farmers to appreciate long–term benefits deriving from good agronomic practices. In addition, it will increase ownership of the project by farmers which is needed for perpetuation of productivity.

V.5. ***Sub–component 1.2: Strengthening the Capacity of Local Authorities*** to identify, formulate and implement project activities including enforcement of local water bye–laws. The Water Act 2002 proposes to create boards to regulate supply of water locally. Disposal of waste water, industrial effluents and solid agricultural and municipal waste are major causes of water pollution. Local authorities have therefore an important role to play in distribution and management of local water resources including enforcement of regulations to maintain water quality and supplies. The project will therefore support local authorities in the project areas to promote efficient utilisation of water, safe waste disposal methods, protection of riparian areas and in collection and storage of data within areas

of their jurisdictions; to develop local water bye laws and ensure enforcement; and strengthen integrated planning capacity by organising or supporting planning and training workshops.

V.6. ***Sub–component 1.3: Strengthening the Capacity of Local Communities*** to be able to identify, formulate and implement project activities. It is expected that at the end of the project period local communities will own and manage the projects for sustainability. The capacities of the local communities needs to be strengthened in order to mobilise resources including human resource, encourage participation of all members especially that of women, and instil project management skills for project sustainability. Activities in this sub–component will therefore include among others: (i) awareness raising**; (**ii) community mobilisation; (iii) training on organizational and managerial support/skills; (iv) transfer of technical knowledge; and (v) formation and support of WUAs**.**

V.7. The project will work with VDCs and other formal and informal community groups, particularly FBOs and women groups that are already active in the area. The project will particularly encourage and support inter–village development coordination at watershed levels. In this connection, the proposed WCACs will be expected to be the main drivers in the identification and formulation of inter–community projects.

V.8. Water investments are usually large requiring financial and technical capacity that may be beyond the capacity of local communities to conceptualise or manage. Benefits and also costs deriving from such projects may also spill over to more than one village, location and district. While local communities could initiate such schemes by drawing on the government water and environmental master plan, they lack capacity to design and implement such large projects. Assistance would therefore be required from central and local governments because of the geographical coverage, financial and technical requirements.

V.9. Technical backstopping and facilitation of planning, implementing, and evaluating the program interventions would be provided by NGOs in the area that have technical capacity; other service providers; and as well as MOA, MOE, MOCDM, MOWRMD, MOENRW, WRMA, and NEMA. The *District Agriculture and Livestock Development Offices* would perform the key role of interfacing with farmer organizations and liaising with the project coordination office.

***Component 2:* Harnessing Water Resources to Promote Agricultural Growth**

V.10. This component will entail two main activities – water harvesting and water distribution to support increased agricultural productivity. A secondary activity will be to generate power through mini hydro–power stations. Most of the project costs (about 60%) are likely to be incurred under this component**.** Opportunities exist for starting new projects or up–scaling some of the on–going ones. There are many on–going water projects in the area for both domestic use and irrigation. Many have remained small mainly due to lack of financial resources while the socio–economic impact of the larger government–owned schemes has been undermined by poor management. There are also a number of plans by the government that have remained unimplemented for lack of financial resources. Through this component the project will assist the community in the following ways:

- *Replication and up–scaling of successful projects* in a manner that retains their viability. The up–scaling may be horizontal or vertical i.e. it may entail a geographical expansion to cover a wider area or in intensity to store and/or deliver more water per household or to embrace additional elements such as agro–forestry or land reclamation.

- *Revamping and rehabilitating projects* (dams, boreholes, water pans etc) that have collapsed due to financial or management constraints.
- *Financing new projects initiated through a participatory approach.* Such projects may include construction of new dams, boreholes, pans, irrigation schemes, and hydro power dams. These may involve one or more communities.
- *Supporting on–farm water harvesting and storage.* This may include construction of water tanks/storage facilities, purchase of tanks etc.

V.11. Experience has shown that community projects have greater chance of sustained success when there is enhanced local ownership. Accordingly, community activities financed under the project will require community contributions. Such contribution may be in cash or in kind

***Component 3:* Protection and restoration of water catchments**

V.12. For the continued supply of water, catchment areas have to be protected and those already destroyed or denuded restored. Most of the indigenous forest cover has been cut down considerably reducing the biodiversity of the area. The project area also suffers considerable soil erosion and pollution. The main sources of pollution are siltation, agro–chemicals, agro–processing factories and to some extent urban waste. The project will ensure catchment protection and restoration through promotion of the following activities:

- Afforestation and reforestation of forest land;
- Protection and diversification of existing biodiversity resources;
- Agro–forestry practices;
- Erosion control measures;
- Protection of riparian areas (river banks, wetlands etc.);
- Promotion of safe disposal of industrial effluents and urban waste.

V.13. Protection of catchment may include acquisition of land from government and private individuals to be set aside as protected areas such as wetlands, biodiversity/gene pools etc. Sub–projects identified in the community plans may also include the development of village tree nurseries to support agro–forestry.

***Component 4:* Establishing a Monitoring and Evaluation System**

V.14. The M&E would have three main activities. The first activity would be to provide and build a knowledge base. This would be achieved through conducting of baseline surveys and studies. This information will be important for the design and implementation of project activities and for carrying out assessments. Knowledge building would continue through out the project life.

V.15. The second activity would be to monitor progress in the implementation of the project. This will be achieved through regular reporting at various levels. In addition, there would be mid–and end–term evaluations.

V.16. The third activity under M&E would be to assess the impacts of the project interventions because the implementation of the project is likely to have significant and lasting impacts on the lives of the people and the environment in the project area. It is important that such impacts be carefully monitored and the results used to steer the implementation of the project. The potential impacts are socio–economic or biophysical changes.

V.17. ***Socio–economic Impacts.*** The essence of M&E, is to assess whether the project interventions would improve the social and economic conditions of the community and find out whether the identified potential negative impacts are sufficiently mitigated. In this connection, poverty levels will be determined at the start of the project based on the 1999 census and other government documents including the recently launched Poverty Maps. M&E will be conducted in two ways – a participatory approach in which the communities give their views on predetermined parameters. The other approach which would complement the first one is to adopt a scientific method which provides a more rigorous analysis. Data for the latter approach will be collected via household budget surveys conducted by Central Bureau of Statistics (CBS) and other systems used by service providers. In addition, communities will be required to provide information about their socio–economic status at the time when they present their proposal for funding.

V.18. ***Environmental Impacts.*** It is a requirement that any major project in Kenya be subjected to an environmental impact assessment. In order to comply with this requirement, the M&E would aim at assessing the extent to which project interventions are impacting on environment including river flow, water quality in terms agro–chemical and urban waste pollution, siltation and sedimentation of rivers and dams, soil leaching and nutrient loss, and bio–diversity. The project will also monitor the incidence of pests and diseases and possible impacts of these on human and animal welfare in the project area. The environmental assessments would be conducted mainly using sampling techniques. The exercises would require high technical skills and testing equipment that the communities are unlikely to possess. The task would therefore fall on the government and quasi–government bodies.

V.19. Some of the indicators that may be included in the M&E are indicated in Table 1 below. This list may be refined further after the baseline studies have conducted.

Table 1: Socio–economic and Environmental Assessment Indicators

Parameter	Target
1. Number of farmers adopting ILWM	Increase during the project period
2. HDI Income	Increase during the project period
3. Change in farm enterprise mix	Increase in total output
4. Health and nutrition levels	Improvement
5. Gender equity/participation	Improvement
6. Employment	Increase
7. Savings and Investments	Increase
8. Incidence of new vectors and diseases	No increase
9. Water quality	Improvement
10. Soil erosion, sedimentation, siltation	Reduction
11. Nutrient loss, soil leaching,	Reduction
12. Biodiversity	Improve
13. Forest cover, protected areas, trees planted	Increased

VI. INDICATIVE COSTS

VI.1. Table 2 shows the capacity of private, community and public water installations in the project area that require some intervention. The figure of 23.0 million m^3 (Annex 2) excludes boreholes, rehabilitated and well functioning schemes, and the large dams for power–generation. Due to poor maintenance, siltation and sedimentation, the present water holding capacity of the affected dams has declined to about 11.1 million m^3 (or 48.3%). The government estimates that it would require US$12.3m to rehabilitate the facilities. On the assumption that communal and public water installations account for 75% of the total installed capacity, financial resources required to rehabilitate the sites would amount to US$9.1m. The government has also identified 127 new sites for development of surface and sub–service water dams and pans, and irrigation (see Annex 3). These sites have remained undeveloped due to resource constraints. The cost of developing the new sites is estimated at US$8.6m or US$1.51 per cubic metre. These government identified sites and cost estimates do not include possibilities of embedding mini hydro–electric schemes.

VI.2. In addition to the government proposed sites, communities in the project area will be expected to come up with their own projects of which some are likely to include mini hydro–power stations. Irrigation projects being implemented in Kirinyaga and Embu serving about 1,500 households each, cost Ksh13–40m (US$0.2–0.5m), or Ksh26m (US$0.3m) on average. The mini hydro–power schemes that are being implemented by ITDG in Meru, Embu, and Kirinyaga excluding transmission and distribution, cost about US$3,500 per KW. Cost of civil works also varies considerably depending on the site specific geo–features. In Machakos communities have been active in constructing sand dams which may not be captured in the official statistics. The average cost of these dams is about US$10,000. Including the cost of these community led projects could therefore raise the investment possibilities easily by another US$10m. Table 2 below shows a possible investment scenario.

Table 2: Estimated Investment Costs of Water Development

	Existing Facilities	Proposed New Development
Government sites (No.)	995	127
Rehabilitation/construction (US$m)	12.28	8.61
Average cost/m^3 (US$)	0.53	1.61
Community proposed projects		
– 20 dams and irrigation systems @ US$0.5m	–	10.00
– 10 mini hydro–power stations @ US$0.3m	–	3.00
– 200 sand dams @ US$10,000	–	2.00
Total investment cost (US$ million)		35.89

VI.3. In accordance with the new development paradigm, community participation in planning, management and ownership of public assets is encouraged. The costs shown in Table 2 do not include the costs of preparing the communities to take charge of the new responsibilities. These have been estimated at about 12.5% and incorporated in Table 3. It is assumed that costs indicated by the government already include costs of monitoring the implementation and effects of new interventions. The monitoring and evaluation and project coordination are estimated to consume 10% each while catchment protection and restoration is assumed to take 7.5% of base cost. The first year of the project is dedicated mainly to project preparation including baseline studies. Due to difficulties of anticipating community responses, implementation costs have been spread out evenly over the project period. Most of the materials required for implementing the project components would be available locally, although base cost materials will have a significant proportion of foreign inputs. As shown in Annex 5,

the estimated development costs of projects in Kenya are within the standard costs. However, development costs vary considerably depending on focus, complexity and breadth of each project.

Table 3: Cost Summary by Component and by Year

Costs in US$ million	Indicative Costs	% of Total	2005	2006	2007	2008	2009	2010
1. Capacity building (*)	4.49	8.9%	2.00	0.50	0.50	0.50	0.50	0.50
2. Harnessing Water (**)								
2.1 Existing Government Projects	*20.89*	*41.6%*	*2.00*	*3.78*	*3.78*	*3.78*	*3.78*	*3.78*
2.2 New Community Proposals:	*15.00*	*29.9%*	*0.00*	*3.00*	*3.00*	*3.00*	*3.00*	*3.00*
Community Projects– Highlands	*10.00*		*0.00*	*2.00*	*2.00*	*2.00*	*2.00*	*2.00*
Community Projects– Power	*3.00*		*0.00*	*0.60*	*0.60*	*0.60*	*0.60*	*0.60*
Community Projects – ASALs	*2.00*		*0.00*	*0.40*	*0.40*	*0.40*	*0.40*	*0.40*
	35.89	71.4%	2.00	6.78	6.78	6.78	6.78	6.78
3. Protecting and Restoring Water Catchments (*)	2.69	5.4%	0.00	0.54	0.54	0.54	0.54	0.54
4. Establishing M&E (***)	3.59	7.1%	0.00	0.72	0.72	0.72	0.72	0.72
5. Project Administration	3.59	7.1%	0.60	0.60	0.60	0.60	0.60	0.60
Total Base Costs	50.25	100.0%	4.60	9.13	9.13	9.13	9.13	9.13
Contingencies (15%)	7.54		0.69	1.37	1.37	1.37	1.37	1.37
Total Project Costs	57.78		5.29	10.50	10.50	10.50	10.50	10.50
Foreign	*8.97*	*15.5%*	*0.60*	*1.67*	*1.67*	*1.67*	*1.67*	*1.67*
Local	*48.81*	*84.5%*	*4.69*	*8.82*	*8.82*	*8.82*	*8.82*	*8.82*

Foreign exchange cost: (*) 10%; (**) 30%; (***) 20%.

VII. PROPOSED SOURCES OF FINANCING

VII.1. The estimated cost of implementing government water projects that are already in the pipeline in the project area are estimated at US$20.9m as shown in Table 3. The government through the budget for FY 2004/05 has earmarked a total of Ksh11bn (US$134m) to MOA, MOWRMD and MOENRW for development projects for the whole country. Most of these resources are expected to come from external donors and are likely to be tied to specific donor–funded projects. In addition, past experience has shown that there is a wide disparity between printed estimates and actual expenditures. The *Public Expenditure Review* for 2004 shows an implementation rate of 40% of the printed estimates. The additional domestic resources available for this project are therefore likely to be quite small. But even assuming that the government could afford annually US$3m (Ksh240m) over the project period, donors would need to contribute about US$40m in order to close the financial gap. This is because the beneficiaries capacity to make significant contributions to component 2 of the project is proscribed by the prevalent level of poverty in the area. Possible sources of financing include ADB which has already identified water as its critical area of investment, World Bank, and GEF. Table 4 below shows a summary of possible sources of financing.

Table 4: Possible Sources of Financing		
	US$	% of total
Government	15.00	26
Financing institution(s)	40.00	69
Beneficiaries*	3.00	5
Private sector	0.00	0
Total	58.00	100
(*) On the basis of *Njukiiri Nthambo Self Help Irrigation Project* in Embu, by Plan International and *Gakui Self Help Water Project* in Kirinyaga.		

VIII. PROJECT BENEFITS

VIII.1. The community driven nature of the investments makes it difficult *ex ante* to undertake a cost–benefit analysis of the project. It is apparent however that these benefits would have an impact at local, national and global levels.

VIII.2. At the local level, the project would contribute to mitigating the problems of unsustainable land use practices, declining productivity, and environmental degradation. The project would promote integrated land use and water management systems that could provide multiple benefits. Some of the benefits include improved soil fertility, increased fuel wood production, reduced soil erosion, river siltation and sedimentation among others. Water for irrigation would help to secure food supply, and enable farmers to engage in growing of high–value crops for local and export markets. In addition, cultivation of medicinal and other high–value crops and plants would increase incomes for households practicing agroforestry. By promoting water harvesting time used to fetch water would be reduced thereby allowing the communities especially women to engage in other productive activities. The generation of hydro–power at the local level would reduce the cost of supplying electricity and create opportunities for on– and off–farm productive activities. All these would contribute to food security and improved livelihoods of the people. Furthermore, by enabling the community to cooperate, the project creates a platform from which other vital development activities such as input and output market infrastructures, improved crop and animal production, health, education services and socio–economic skills development can be launched.

VIII.3. At the national, provincial and district levels the project would promote rural development strategies that integrate eco–system concerns. The project would also lead to increased production of food and export crops and hence contribute to the national objective of improving food security and reducing poverty. The greatest impact of the project on agriculture will be expanding the scope for production of horticultural crops (that was hitherto threatened by declining water supplies), cotton, oil crops and fodder etc. Livestock production for both dairy and beef will likewise improve due to availability of fodder and water supplies. The other spin–off effect from the project will be scope for introducing aquaculture as an economic activity. In addition, the project will, through generation of power, make it possible for development of on– and off–farm agro–processing leading to creation of employment opportunities. The project would also lead to provision of clean and regulated water especially downstream thus reducing conflicts between rural and urban populations. The economic rate of return from the project is therefore expected to be high.

VIII.4. At the global level the project's contribution would be to improve biomass production, sequester above and below ground carbon, and reduce pollution and siltation of watercourses and oceans. This would provide benefits towards mitigating greenhouse gas effects on the global climate.

The project would through reforestation and catchment restoration benefit several natural habitats in this area that are significant for preservation of biodiversity. Finally, the project would contribute to commitments made under several global conventions, in particular the *Convention on Biodiversity*, *UN Framework on Climate Change*, and *Convention to Combat Desertification*.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. The program would be demand driven and implemented under the existing institutional arrangements. The project would also seek to the extent possible to up–scale or complement on–going projects in the area in order to benefit from common synergies and reduce incubation period. ***In recognition of the existing capacities and likely project scales, the program would have two windows***.

IX.2. ***The first window would deal with small grants*** to finance community initiated activities at the village/community level. The VDCs would be the main bodies for proposing and implementing approved activities. Members of the VDC include, *ex officio*, the assistant chief of the particular sub–location. NGOs representative in the area could be co–opted to provide technical advise where needed. The existing LDCs consisting of extension agents, local councillors, and service providers, would help to vet and collate VDC plans. Proposals approved at location level would be forwarded to DSCs for technical vetting and funding. As a condition for funding, community organisations would need to be *bona fide* registered bodies with acceptable rules and regulations governing their operations. They would also need to have bank accounts through which financial resources for their projects would be passed. Implementation of selected proposals would be carried out through close supervision of the DSCs. The DSCs consisting of representatives of line ministries, NGOs and communities would approve and ensure that the selected proposals are implemented and that results meet the targets set by the project. To avoid the project being overwhelmed with many small activities that might become difficult to supervise and monitor, a minimum project proposal could be set at US$100,000, subject to review.

IX.3. ***The second window would deal with the larger projects*** that cut across more than one location or district. It is envisaged that most of the project funds, say 80% of funds allocated to components 2 and 3, would be absorbed by these types of investments. Proposals for investment at this level may originate from the community, NGOs, local authorities or the government agencies. Because of the need to consult a broad spectrum of stakeholders and the technical capacity required, the responsibility for the planning and implementation of such projects would be consigned to DSCs, WCACs or consultants appointed by the DSCs. To ensure that the project benefits reach as many people as possible, it may be necessary to cap the funds that may go a single investment, say US$5m.

IX.4. In order to prioritize investments under both windows, selection criteria would be established which would favour aspects such as financial viability and community commitment.

IX.5. At the national level, a ***National Steering and Management Committee (NSMC***) would provide lead coordination to ensure that the programs of the ministries involved including their budgetary allocations complement project investments. NSMC would consist of members from line ministries, and private stakeholders with capacity to make positive contribution to the project management. The main responsibilities of the NSMC would include:

- securing inter–agency coordination and collaboration;
- recommending changes when necessary;

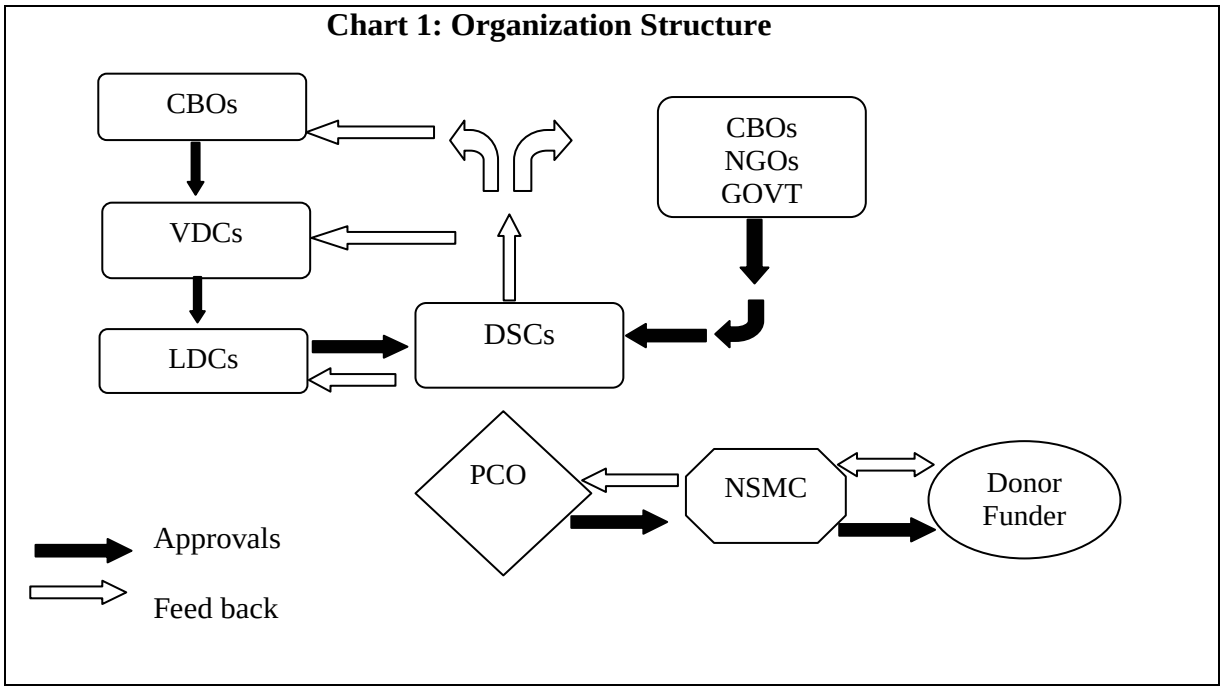
- reviewing progress of implementation every quarter and provide direction to the PCO;
- ensuring capacity building; and
- promoting the integrated land and water management system approach.

IX.6. A ***Project Management Office (PMO)*** will be set up at MOWRMD headquarters for the duration of the project and it will operate under the guidance and supervision of the Permanent Secretary, MOWRMD. The day–to–day coordination and monitoring of project activities would be handled by a project coordination office. The role of the project coordination office will be to:

- release funds against agreed proposals and work plans;
- ensure that the institutions utilizing project funds set up proper accounting system and maintain proper accounts, and promptly make claims/returns to fund the project account;
- coordinate project activities;
- prepare progress reports for presentation to donors;
- monitor and evaluate the project as a whole to ensure effective implementation;
- periodically hold meetings at selected places in the project area to review the progress made and problems encountered in the implementation and to agree with DSCs on a work plan, and
- raise awareness, mobilize technical assistance, and assist districts with their procurement where needed.

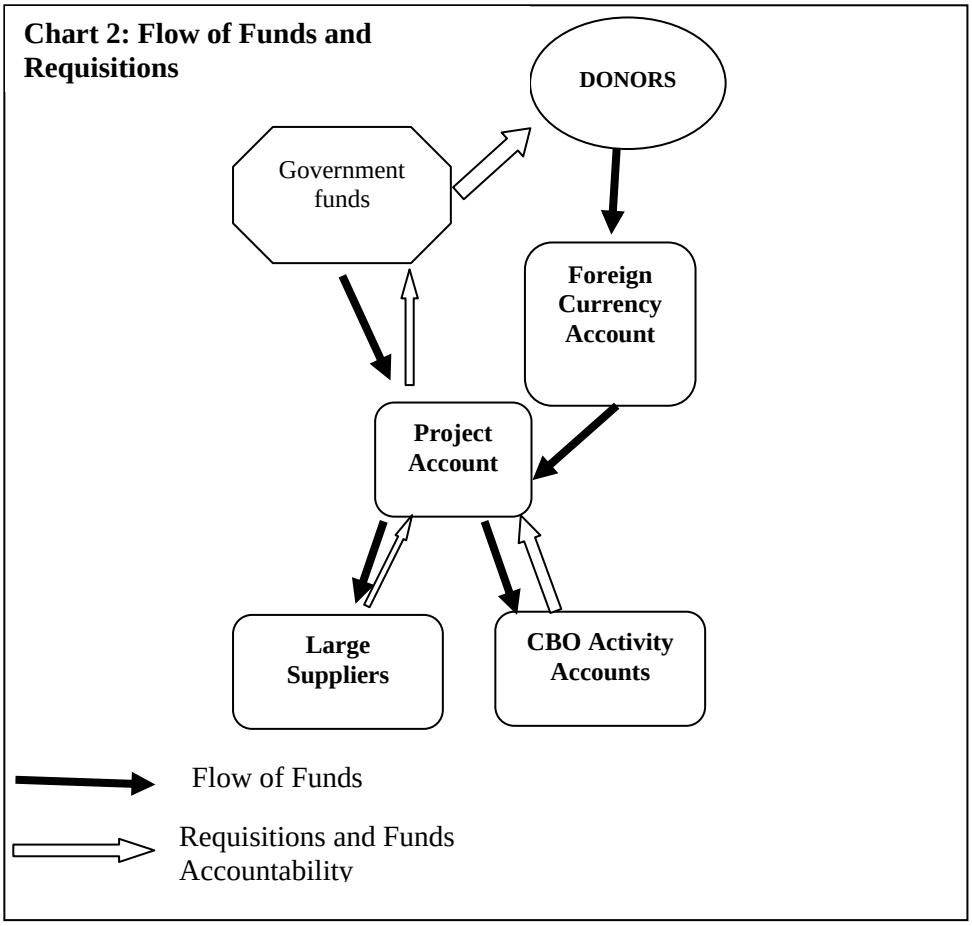
IX.7. The organisation structure depicted in the chart below shows how project investments would be initiated, approved, implemented and how the feed back mechanisms would work.

Chart 1: Organization Structure



IX.8. ***Financial Management.*** The project's financial management system should be designed to support efficient and effective delivery of outputs as well as generation of timely reports for monitoring funds utilisation. In this regard, CBOs and farmer groups should prepare quarterly fund accountability statements to be reviewed and consolidated by VDCs. These reports should thereafter be remitted to DSCs where the District Accountant shall vet and summarize them for reporting to the PCO. The PCO finance officer shall consolidate the district reports into quarterly financial reports for submission to NSMC.

Chart 2: Flow of Funds and Requisitions



IX.9. ***Disbursement Arrangements and Flow of Funds.*** Project funds will be controlled through a Project Bank Account managed by the PCO. The Project Bank Account would be funded from the Foreign Currency Account to be maintained by the Treasury to which donors/funders would put their money. The replenishment of the project account would be based on quarterly reports submitted and approved by NSMC. CBOs and farmers' groups would receive funds directly from the Project Account on basis of claims vetted and submitted by the DSCs.

IX.10. ***Procurement Procedures.*** Most of the procurement for the project will be in the form of small transactions taking place at the sub–location, location and district levels. Each participating district will receive funds in tranches before applying for a second fund tranche. Financing will depend on applications received from communities, and their procurement details will depend on the needs identified by the communities. Procurement would be carried out in accordance with government simplified procurement procedure. Large suppliers would be paid directly from the project office on basis performance reports prepared by the DSCs.

IX.11. ***Monitoring and Evaluation.*** Monitoring and Evaluation activities will be coordinated by the M&E officer in the PCO. Socio–economic data will gathered at the community level during the project start–up phase and regularly through CBS Household Budget Surveys. The *World Agroforestry Center* will undertake biophysical measurements (remote sensing as well as on–site data collection) in collaboration with the Department of Soil Science at KARI. The MOWRMD will regularly monitor river flow and water quality. Is this agreed already are there cost implications, what is different about it from component one.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. Kenya has a well trained pool of qualified and experienced engineers, soil and crop scientists to undertake construction of dams and irrigation schemes. Technical assistance may however be required to undertake environmental impact assessment studies and to monitor changes in environment resulting from various project interventions. The *National Environmental Monitoring Authority* would be contracted to carry out these technical evaluations.

XI. ISSUES AND PROPOSED ACTIONS

XI.1. There are number of issues that will need elaboration before the project commences as indicated below.

XI.2. ***Sources of Finance:***

- *Donor Financing.* Although a tentative figure of US$40m has been used in this project proposal, the external sources of funds are unknown at this stage. It is therefore not clear whether funding would be on loan or concessional basis which could have an impact on project design.

- *Government Contribution.* African governments are expected to raise their budgetary allocations to NEPAD–CAADP recommendations to about 10 percent. The most recent information indicates that Kenya's allocation to the sector is about 5.0%. Budget estimates for the sector for 2004/05 indicate an increase to 6.47% from 5.39% in the previous year. To reach the target figure of 10%, will therefore require significant new inflows and a major reallocation of resources. This is expected at a time when the government budget is undergoing severe strain.

- *Community Contribution.* The *Harambee* spirit has been a significant mechanism for mobilising social capital formation in Kenya. The project's community driven approach is expected to build on that spirit to mobilise some resources from the communities. However, it is difficult to anticipate or even plan the timing and magnitude of the flow of the resources since communities will be the ones to volunteer the projects.

XI.3. ***Anchoring of the Project.*** Although MOA is presently the lead government institution for coordinating the NEPAD–CAADP initiative, the orientation of this project is heavily biased towards water development and management. Capacity for implementing the project would seem to be more available in the MOWRMD. In addition, the implementation of Water Act 2002 has just commenced. Some of the institutions proposed in the new Act with significant roles have yet to be established. Nevertheless, it appears that consideration should be given to anchoring the project at MOWRMD.

XI.4. ***Collaboration and Coordination.*** The project involves several organisations from the government, the donor community and beneficiaries as well. The need for coordination and collaboration among various actors in the sector is therefore vital for the success of the project and also to make it possible to exploit existing synergies, and to efficiently use human resource capacity for implementation and supervision of projects.

XI.5. ***Baseline Studies.*** The interventions contemplated in the project are likely to have lasting impacts on the lives of the people and the environment in the project area. The impacts could both be positive or negative. Dams could for example increase incidence of malaria and water borne diseases while increase in vegetation could create habitat ideal for wildlife which could lead to conflicts between farmers and animals. It is therefore necessary to conduct baseline studies that could provide information for conducting a more detailed cost–benefit analysis of the project, determining project monitoring indicators and incorporating means of mitigating the negative impacts in the project design.

XI.6. The other reason for conducting baseline studies is that dam construction requires elaborate technical designs including hydrological surveys. While such designs may exist for the government–led projects, the new proposals from the communities may need to start the process from scratch.

XI.7. ***Resettlement of the Displaced Persons.*** The construction of dams for water harvesting and power generation and possible acquisition of private land for protection of catchments will inevitably lead to displacement of people from their homes or occupation of part of their land. A policy for resettling or compensating the affected households will need to be determined. Some of the community projects such as erosion control, diversion or direction of road runoff may affect individual farmer's land. While some farmers may accept resettlement or compensation, there may be some who will not agree. How to deal with such situations is an issue that will need to be resolved.

XI.8. ***Ownership of the Assets Created.*** Project interventions whether initiated by communities or by the government will create assets. The ownership of the assets needs to be decided before the project commences to avoid grabbing of public assets by some individuals. This will be necessary in order to determine the responsibility for their operations and maintenance.

XI.9. ***Scale of Projects.*** One of the issues that will need to be decided is the scale of investments for both community and government initiated activities. Putting the threshold too low has the risk of inviting too many small projects that may become difficult to monitor, supervise and overload accounting and audit. Raising the figure too high poses two main problems. First, it concentrates the risk of the project to a few activities; secondly, it reduces the spread of the benefits to a smaller geographical region. A minimum and maximum size of individual investments will therefore need to be determined in order to spread benefits without overwhelming management capacity.

XI.10. ***Support for Private Sector Initiatives.*** As indicated before, ongoing water harvesting activities involve private, communal and public initiatives. The project proposal assumes that the funds mobilised for the project will be availed to community and government initiated investments. Since the current development paradigm is based on increasing role of private sector–led development, a case may be made for allocating some of the funds to private sector water harvesting and management and land reclamation and afforestation. As indicated a number of private water dams and pans are in need of rehabilitation in order to hold water to their installed capacity. Such private schemes could therefore be lent some of the funds at cost recovery rates since they have a social benefit embedded to them. This is one matter that will need to be considered.

XI.11. ***User Fees.*** The assets created will need to be operated in order to provide benefits to the community. This means that people will need to be employed, paid and possibly trained to operate the systems. In addition, the assets will need to be maintained and provided for so that they can continue providing service and be replaced when they break down. Government cannot be expected to continue allocating resources for such operations and maintenance. Communities should at the time of project initiation be made to understand that user fees will be levied for operations and maintenance. One other advantage of levying user fees is to reduce wastage and instil market discipline.

XI.12. ***Conflict Resolution.*** Access to water supplies for human and livestock consumption and irrigation has been a source of conflict between communities. Formation of WUAs and involvement of WCACs would help to reduce the conflicts.

XII. POSSIBLE RISKS

XII.1. Although the project has been conceived taking into account lessons learned from previous experiences, like all new projects it is likely to encounter both localized and more generalized risks that could undermine its success and long–term sustainability. Table 5 below provides in a summary form the risks likely to be faced by the project.

Table 5: Critical Project Risks

Cate-gory	Specific Risk	Risk Mitigation Measure
Institutional	• Inability of the implementing agencies to work in harmony	• Form a stakeholders steering committee.
	• Scatter of sector issues across several Ministries may cause diffusion of responsibility and coordination problems	• Form an inter–ministerial coordination committee
	• Political interference – local politicians could attempt to hijack project activities for their own interest	• Involvement of communities in decision making processes
	• Farmers disinterest and apathy in the project	• Pre–project sensitisation and mobilisation of farmers
	• The capacity of implementing agencies may be stretched leading to poor program coordination.	• Project funds will enable hiring additional staff.
Management	• Community groups may lack the capacity to identify, prepare and implement investment proposals for funding.	• Incorporate capacity building component in project design.
	• Community members may be unable to manage resources	• Maximize community participation and provide relevant training.
	• Beneficiaries may divert funds available to other purposes	• Disbursement of funds to be tied to measurable indicators.
	• Lack of and/or poor maintenance of investments	• Provide a budget for maintenance of assets. User fees to be applied to maintaining assets.
	• Difficulty in identifying changes resulting from project interventions	• Develop M&E system to monitor progress and to adjust interventions based on observed outputs.
	• Delays in implementation due to the unresolved issues or lack of financing	• Coordination between various actors to ensure that every stage of implementation dovetails into the other
Market	• Structural changes in domestic and foreign demand could alter the competitiveness of the commodities being produced by farmers	• Provide market information and intelligence.
	• Conditions of market access including non–tariff barriers may militate against farmer interest, e.g. EUREGAP	• Study markets thoroughly before encouraging farmers to produce. Also into trade agreements.
	• Failure to reach a critical mass in the commodities being produced by farmers to ensure market interest	• Encourage contract farming

ANNEXES

Annex 1: Map of Project Area

Annex 2: Existing Dams and Cost of Rehabilitation

Annex 3: Proposed New Water Schemes by Kenya Government

Annex 4 Budget allocations for the Sector Ministries

Annex 5: Example of Standard Costs for Irrigation

Annex 1: Map of Project Area

Annex 2: Existing Dams and Cost of Rehabilitation

District	No. of dams	Installed capacity (m^3)	Current holding capacity (m^3)	Estimated cost of rehabilitation (Ksh)	Cost in Ksh per m^3 of installed capacity
1. Kirinyaga	7	361,000	250,000	3,780,000	15.12
2. Muranga	2	880,000	520,000	8,000,000	15.38
3. Nyeri	87	261,500	1,352,136	35,451,177	26.22
4. Embu	1	18,000	150,000	1,700,000	11.33
5. Mbeere	29	267,100	139,600	29,500,000	211.32
6. Isiolo	20	638,300	56,800	32,400,000	570.42
7. Laikipia	220	8,194,900	3,328,000	403,250,000	121.17
8. Machakos	598	11,892,600	4,831,200	464,085,000	96.06
9. Meru	27	530,300	433,800	3,630,000	8.37
10. Tharaka	4			600,000	0.00
Total	995	23,043,700	11,061,536	982,396,177	42.63
Total cost in US dollars (US$1 = Ksh80)				$12,279,952	
Source: MOWRMD					

Annex 3: New Water Schemes Proposed by Kenya Government

District	No. of dams	Proposed capacity (m^3)	Cost in Ksh	Cost in Ksh per m^3
1. Kirinyaga	7	850,000	164,400,000	193.41
2. Muranga	6	29,000	8,700,000	300.00
3. Nyeri	19	675,500	71,500,000	105.85
4. Embu	8	172,000	18,700,000	108.72
5. Isiolo	5	135,000	25,000,000	185.19
6. Mbeere	17	213,900	51,500,000	240.77
7. Machakos	25	358,700	33,750,000	94.09
8. Meru	5	2,000,000	53,000,000	26.50
9. Tharaka	5	77,200	17,500,000	226.68
10. Meru S.	4	5,900	10,300,000	1745.76
11. Meru N.	10	180,000	197,500,000	1097.22
12. Laikipia	16	715,000	49,100,000	68.67
Total	127	5,412,200	700,950,000	129.51
Total cost in US dollars (US$1 = Ksh80)			$8,610,875	

Source: MOWRMD

Annex 4: Budget Allocations for the Sector Ministries

Ksh million	2003/04	2004/05	2005/06	2006/07
Recurrent Budget				
Sector Ministries Allocation	11,847	11,730	12,263	12,782
Total Recurrent Expenditure	333,868	353,840	370,000*	390,000*
% of Total Recurrent Budget	*3.55*	*3.32*	*3.31**	*3.28**
Development Budget				
Sector Ministries Allocation	9,109	16,785	17,429	16,507
Total Development Expenditure	54,580	86,751	90,000*	100,000*
% of Total Development Budget	*16.69*	*19.35*	*19.37*	*16.51*
Total Budget				
Sector Ministries Allocation	20,956	28,515	29,692	29,289
Total Budget	388,448	440,591	460,000*	490,000*
Sector Ministries as % of Total Budget	*5.39*	*6.47*	*6.45**	*5.98**

Source: Estimates of Recurrent and Development Expenditure 2004/05
* Own estimates.

Annex 5: Example of Standard Costs for Irrigation

Unit Investment Costs in US$ per hectare						
Region	Large irrigation schemes	Rehabilitation of large irrigation schemes	Small irrigation schemes	Inland valley bottoms	Soil and water conservation	Land improvement
North Africa	6,000	2,000	2,000	600	300	100
Dry Sahelian Belt	15,000	5,000	4,000	600	300	100
Gulf of Guinea	10,000	3,000	3,000	600	300	100
Central Africa	10,000	3,000	3,000	600	300	100
East Africa	10,000	3,000	3,000	600	300	100
Southern Africa	9,000	3,000	2,500	600	300	100
Islands	8,000	2,500	1,500	600	300	100
Kenya*	5,410–12,650	3,070	2,234–4,450	n.a.	208	91

Assessing unit investment costs

Unit investment costs were based on information obtained from AQUASTAT in 1995, adjusted to take into account unit costs used in recent agriculture investment projects provided by TCI in 2002. In view of the large discrepancy between regions in terms of unit costs, Africa was divided into 7 main regions showing some kind of physical and economic homogeneity and unit costs were assessed for each region and for each type of intervention. The results are presented in the table here above.

Source: Estimating the potential for land and water investment in Africa, AGLW/FAO, 2002.

* The figures for Kenya are based on development costs of specific projects, i.e. Ewaso Ng'iro, Bura/Hola, Mwea, Gakui, and Mt Kenya East Natural Resources Management. Where the area to be irrigated was not provided, estimates were made on assumption that each household would allocate about 0.5 ha for irrigation.