



**New Partnership for
Africa's Development (NEPAD)
Comprehensive Africa Agriculture
Development Programme (CAADP)**



**Food and Agriculture Organization
of the United Nations
Investment Centre Division**

GOVERNMENT OF THE REPUBLIC OF UGANDA

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume V of VI

BANKABLE INVESTMENT PROJECT PROFILE

Natural Resource Management Project

November 2004

UGANDA: Support to NEPAD–CAADP Implementation

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

Bankable Investment Project Profiles (BIPPs)

Volume II: Smallholder Irrigation Development and Water Harvesting Project

Volume III: Livestock Development Project

Volume IV: Agricultural Marketing Project

Volume V: Natural Resource Management Project

Volume VI: Aquaculture Development Project

NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Uganda

Sector of Activities: Environment and Natural Resources

Proposed Project Name: **Natural Resource Management Project**

Project Location: National

Duration of Project: 5 years

Estimated Cost: Foreign Exchange US\$6.7 million
Local Cost..... US\$24.8 million
Total US\$31.5 million

Suggested Financing:

<i>Source</i>	<i>US\$ million</i>	<i>% of total</i>
<i>Government (central and local)</i>	6.3	20
<i>Financing institution(s)</i>	12.6	40
<i>Beneficiaries</i>	3.2	10
<i>Private sector</i>	9.4	30
<i>Total</i>	31.5	100

UGANDA:
NEPAD–CAADP Bankable Investment Project Profile
“Natural Resource Management Project”

Table of Contents

Abbreviations.....	iii
I. PROJECT BACKGROUND.....	1
A. Project Origin	1
B. General Information.....	1
C. Government Policy	3
D. Institutions.....	3
E. Constraints and Opportunities	4
F. Ongoing Programmes.....	5
II. PROJECT AREA.....	5
A. Topography, climate and soils	5
B. Population.....	6
C. Agriculture	6
D. Infrastructure and Social Services	7
E. Social Setting	7
III. PROJECT RATIONALE.....	7
IV. PROJECT OBJECTIVES.....	9
V. PROJECT DESCRIPTION	9
<u>Component 1: Soil and water management productivity improvement conservation</u>	<u>9</u>
<u>Component 2: Agroforestry</u>	<u>11</u>
<u>Component 3: Project Coordination</u>	<u>13</u>
VI. INDICATIVE COSTS	13
VII. PROPOSED SOURCES OF FUNDING.....	13
VIII. PROJECT BENEFITS	14
IX. IMPLEMENTATION ARRANGEMENTS	15
X. TECHNICAL ASSISTANCE REQUIREMENTS	16
XI. ISSUES AND PROPOSED ACTIONS	16
XII. POSSIBLE RISKS	17
ANNEXES.....	19
Annex 1. Uganda Administrative Map	21
Annex 2. References.....	23

Abbreviations

ADB	African Development Bank
AIDS	Acquired Immune Deficiency Syndrome
APEP	Agricultural Productivity Enhancement Programme
ARDC	Agricultural Research and Development Centre
CAADP	Comprehensive Africa Agriculture Development Programme
CARE	Cooperative Assistance and Relief Everywhere
CBO	Community Based Organisation
CIAT	International Centre for Tropical Agriculture
CSO	Civil Society Organisation
DANIDA	Danish International Development Agency
DATIC	District Agricultural Training and Information Centre
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FEWS–Net	Famine Early Warning System Network
FFS	Farmer Field Schools
FORRI	Forestry Research Institute
GDP	Gross Domestic Product
GEF/UNEP	Global Environmental Facility/United Nations Environment Programme
GoU	Government of Uganda
IDA	International Development Association (of the World Bank Group)
IFAD	International Fund for Agricultural Development
IFDC	International Fertiliser Development Center
IFIs	International Financing Institutions
IFPRI	International Food Policy Research Institute
IUCN	World Conservation Union
JEEP	Joint Energy and Environment Project
KARI	Kawanda Agricultural Research Institute
LC	Local Council
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MTTI	Ministry of Trade, Tourism and Industry
MWLE	Ministry of Water, Lands and Environment
MTEF	Medium–term Expenditure Frameworks
MUK	Makerere University Kampala
NAADS	National Agricultural Advisory Services
NARO	National Agriculture Research Organization
NEAP	National Environmental Action Plan
NEMA	National Environment Management Authority
NEPAD	New Partnership for Africa’s Development
NES	National Environment Statute
NGOs	Non–governmental Organizations
NMTIP	National Medium–Term Investment Programme
NORAD	Norwegian Agency for Development
PEAP	Poverty Eradication Action Plan
PMA	Plan for Modernization of Agriculture
PSFU	Private Sector Foundation Uganda
RPO	Rural Producers Organization
SFI	Soil Fertility Initiative
SIDA	Swedish International Development Agency

TCP	Technical Cooperation Programme
UCA	Uganda Cooperative Alliance
UIA	Uganda Investment Authority
USAID	United States Agency for International Development
VEDCO	Volunteer Efforts for Development Concerns
WB	World Bank

I. PROJECT BACKGROUND

A. Project Origin

I.1. The long term origin of this project idea is the *National Environmental Action Plan* (NEAP) initiated by the World Bank in 1991 and approved by the Government of Uganda (GoU) in 1994. The NEAP’s objective is to integrate environmental sustainability into socio-economic and development planning. An Environment Policy was subsequently adopted in 1994 and a *National Environment Management Authority* (NEMA) was established in 1995, following the *National Environment Statute* (1995), to coordinate the implementation process of NEAP in collaboration with relevant Ministries, NGOs, the business sector and local communities. This project will complement ongoing and planned activities to operationalize the NEAP. The immediate origin of this project is the national stakeholders workshop held in Kampala in February 2004 to validate the NEPAD–CAAD *National Medium–Term Investment Programme* (NMTIP) for the agricultural sector. The workshop identified natural resource management as one of the major bottlenecks to Uganda’s agricultural development and recommended it as a priority area for the formulation of bankable investment projects.

B. General Information

I.2. **Geophysical Features.** The total geographical area of the country is 241,000 km², 75% of which is available for cultivation, pasture or both. The remaining 25% constitutes lakes, swamps and forestry zones. Agriculture (comprising of crops, fish and livestock) is the mainstay of the Ugandan economy, providing a significant share (about 40%) of gross domestic product (GDP), 85% of export earnings, 80% of total employment and the bulk of raw materials used by the mainly agricultural-based industrial sector. About 85% of the population, estimated at 24.75 million in September 2002, lives in the rural areas and depends directly or indirectly on agriculture for livelihoods. Coffee, fish, tea and tobacco are the key export earners followed by horticulture and grains (mainly maize) and beans.

I.3. **The Environmental Policy Framework.** Prior to the adoption of the NEAP in 1994 and the enactment of the *National Environmental Statute* in 1995, the environmental policy and legislation were fragmented, poorly coordinated, outmoded and sometimes contradictory. The *National Environment Management Policy* sets out the objectives, guiding principles and strategies for all aspects of environmental management, including land use, agriculture, water, wildlife, livestock and rangelands, biodiversity, pollution and environmental impact assessment. A *Land Act* was passed in 1998. It defines the four land tenure systems namely customary tenure, *mailo*,¹ freehold and leasehold and how they relate to soil fertility and productivity. The *National Soils Policy for Uganda* was drafted in 1999. It presents guidelines for scientific, proper and sustainable management and utilization of Uganda soils. The *Uganda Forestry Policy* was approved in 2001. It puts emphasis on the inclusion of agroforestry in the agricultural advisory services functions (under NAADS) and the need for collection and timely dissemination of accurate climate forecasts to minimize impacts of the climate related disasters. A *National Environment Information Center* has been established with a mandate to provide accurate and up-to-date information on the Environment to assist in development planning. It produces the “*State of the Environment Reports*” and “*District Environment Profiles*”.

¹ Mailo: a system of freehold land tenure in Uganda, introduced as part of the 1900 Buganda Agreement, which granted ownership in perpetuity to landlords and protected rights to tax-paying tenants. Mailo also denotes an area of land (originally measured in square miles) allotted under this system.

I.4. The *Plan for the Modernization of Agriculture* (PMA) is the GoU’s medium-term framework for the development of the agricultural sector. The PMA recognizes the need to increase agricultural production and productivity to contribute to food security and poverty eradication without degrading the environment. However, the reality on the ground is somewhat different: although the agricultural sector has grown at a rate of 4% per annum in real terms over the past 10 years, some of this growth has been realized through depletion of natural capital and particularly by “mining” the soil. Estimated conservatively, the cost to the national economy from environmental degradation lies between 4% and 12% of GDP.

I.5. **Forestry.** The forestry subsector comprises 14,000 km² of natural forests and savannah woodland on gazetted reserves and about 20,000 ha of plantation forests. Presently, forestry accounts for about 4% of Uganda’s agricultural GDP. The net output stands at 54,000 m³ of sawn wood, one million poles, 18 million m³ of fuelwood and 100,000 tonnes of charcoal. Although at present the contribution of forestry to foreign exchange is little, it has tremendous potential for import substitution, export earnings, economic well-being and environmental security. Natural and plantation forests are widely distributed throughout the country. Many areas also feature agroforestry activities. Moreover, there are important trends in the development of social and community forestry. Forestry management in Uganda has been heavily biased in favour of forests in protected areas. The public sector exercised command and control and exclusionary style of management. The contribution of the forestry resource, especially in the energy sector, had been undervalued. Farm forestry and forests outside the protected areas have received little attention. Increasing pressure on land, resulting from a rapidly growing population, has caused problems of deforestation. With the recent establishment of the National Forestry Authority, agroforestry, as an approach to land use involving a deliberate and purposeful integration of multipurpose trees with crops and/or animals, needs to be promoted, as do other crops with provision of extension services under NAADS. This will ease the problems of poor agricultural production and worsening wood shortages, and environmental degradation can be addressed.

I.6. **Land Resources.** Of the 17 million ha available as arable land, only about 5 million ha are currently under cultivation; this constitutes less than 30% of total arable land. However, land is increasingly becoming a constraint in some parts of the country, particularly in the western and eastern regions where population densities are high. Fertilizer use in Uganda, particularly in smallholder agriculture, is among the lowest in the world. The current level is estimated at less than 1 kg plant nutrient/ha compared to 9 kg/ha average for sub-Saharan Africa, which in turn constitutes only 20% of levels used in Latin America and 5% of levels in East Asia. In addition, while the rest of the world — the developed world taken as a whole and virtually every African country taken individually — increased fertilizer use two- to three-fold (and by much more in many cases), Uganda has fallen behind the rest of the world in fertilizer use by a factor of about four over the course of the past quarter-century. One of the major reasons for this is that it is widely believed, particularly among policy-makers, that Ugandan soils are exceptionally fertile. However, available evidence, particularly from soil scientists and agronomists, demonstrates that whereas soil fertility may once have been naturally high in Uganda at some time in the past, there has been continuous and severe mining of plant nutrients without systematic replacement over the years, which has caused partial or total loss of the productivity of land in quantitative and qualitative terms.

I.7. Soil erosion is also a major form of soil degradation, leading to reduced crop yields and loss of productive land. Land management systems need to be adapted to enhance soil organic matter and restore soil life and function, especially nutrient cycling, soil moisture retention and control of pests. In view of land use intensification and reduced opportunities for natural replenishment, improved organic matter management needs to be supplemented by the launch of an intensive fertilizer drive and

promoting integrated crop–livestock production to restore soil quality and improve organic matter, hence productivity and sustainability.

I.8. **Catchment Water Management and Utilization.** Although Uganda is well endowed with water resources in form of direct precipitation, there have been only limited efforts to enhance efficiency of rainwater use for agricultural production to enhance food security and reduce poverty. This situation is attributed to widespread lack of knowledge and appreciation of potential benefits that accrue from more effective capture of rainwater in the soil profile and storage in the catchment. Moreover, in the recent past, rainfall has become erratic and unreliable in terms of onset predictions. Improvement in rainwater management is a key strategy for optimum use of available water resources and hence productivity of food, fodder, pasture and tree crops. Areas with inappropriate management practices, especially poor vegetative cover, excessive tillage and overgrazing, are experiencing soil nutrient depletion and loss of productive topsoil and rainwater.

I.9. There is a need to mobilize a widespread adoption of conservation practices that maintain soil cover, enhance infiltration and reduce surface flow like cover crops, combinations of annual and perennial species, contour farming, terracing on steep slopes and improved pastures. Integrated water resources management is needed to satisfy water requirements for crops, livestock and domestic consumption while ensuring replenishment of ground and surface water supplies and maintaining buffering functions of wetlands. Integrated land, water and biological resources management is essential to maintain land and water quality and productivity and wider ecosystem services, notably concerning the hydrological regime and carbon sequestration.

C. Government Policy

I.10. The GoU policy on the environment and natural resources (in line with the agricultural sector) is detailed in the *National Environment Management Policy*. It aims at promoting farming systems and land–use practices that conserve and enhance land productivity in an environmentally–sustainable manner. Policy strategies include:

- increasing the attention paid to environmental concerns in agricultural extension, research and training work;
- placing a greater emphasis on environmentally–friendly means of increasing agricultural production; and
- developing farming systems that combine optimum production with the conservation of land resources, including crop–livestock integration, to enhance organic matter management and biomass.

D. Institutions

I.11. Within government, MWLE is mandated to “*support, promote, regulate and guide the utilization of water, lands and environment in line with PEAP and PMA, so as to ensure intra– and intra–generational equity*”. NEMA plays a regulatory role. It ensures that the NEAP and *National Environment Statute* are implemented in collaboration with all stakeholders. MAAIF works in collaboration with MWLE to ensure proper utilization of the environment, especially in the areas of soil and water catchment management. Local governments offer guidance on policy issues, implementation of projects, counterpart funding of projects and support to the formation of farmers’ groups. Training institutions such as Makerere University (Faculties of Agriculture; Forestry and

Nature Conservation; Institute of Environment and Natural Resources; Geography Department) and Colleges of Agriculture have been largely responsible for training people for working in this domain and for conducting research pertinent to natural resources. Most of the research work is being conducted by NARO under its FORRI. Other players include development partners, comprised of FAO, CIAT, IDA, SIDA, WB, NORAD, the Rockefeller Foundation, the Ford Foundation and EU. These have been instrumental in providing project counterpart funding, mainly in the areas of capacity building, research and technology development.

I.12. The private sector, organized under their umbrella organizations, notably PSFU, has been involved in natural resource management through capacity building, direct delivery of advisory services to farmers through NAADS, on a commercial basis, provision of inputs and credit and formation of farmer groups. The NGOs, CBOs and CSOs have also played a significant role in the development of this sector. Their role has mainly been in capacity building, promotion and implementation of specific programmes, and group formation.

E. Constraints and Opportunities

I.13. The notable *constraints* to the environment and natural resource management include:

- continued subdivision of land as the population grows, thus reducing opportunities to invest in environmentally recommended measures;
- uncertainty of land ownership resulting from delayed execution of the land policy; this also leads to reduced investments;
- limited budgetary allocations to the relevant institutions, thus constraining the development and dissemination of technologies;
- limited level of awareness among stakeholders on a wide range of aspects related to natural resources;
- limited institutional capacity among the relevant institutions and organs of government that are mandated to spearhead environmental interventions;
- limited knowledge among all concerned stakeholders of the multiple short- and long-term benefits of conservation agriculture practices and sustainable forest management from farm to catchment level;
- need for organization and empowerment of land users and communities to plan and manage resources and share the resultant benefits;
- high cost and poor quality of inputs for soil quality enhancement; and
- widespread illegal harvesting of trees because of poor forestry resource control systems.

I.14. Despite the constraints outlined above, there are notable *opportunities* that include:

- Inclusion of water harvesting and soil and water conservation components among the priority development and investment plans of MAAIF, with funding from GoU;
- the implementation of NAADS, which has promoted the formation of farmers' organizations and supported improved agricultural service delivery, including on natural resource management and the environment; and

- willingness of a number of national and multinational NGOs and development partners to provide counterpart funding and technical assistance to develop the sector.

F. Ongoing Programmes

I.15. A number of GoU and donor–assisted initiatives are under way, including the following:

- *Soil Fertility Enhancement Research* (worth US\$2.16m), being financed by GoU and CIAT.
- *Forestry Production Systems Research* (worth US\$1.6m) being financed by GoU and EU.
- Tree Seed Project (worth US\$1m), financed by NORAD and GoU.
- *Environment Management and Capacity Building Project II* (worth US\$24m) being financed by WB and GoU.
- *Land Tenure Reform Project* (worth US\$0.19 m) being financed by GoU and SIDA. GoU has recently launched a *Soil Fertility Initiative* (SFI) in collaboration with IDA, FAO, IFPRI and IFDC and other donors that focuses, among other things, on increasing fertilizer usage at the farm level.
- *Kagera Transboundary Agroecosystem Management*, a 2–year project approved for 3 countries, including Uganda. Its to be financed by GEF/UNEP and FAO. It will set up baseline studies to establish how to mobilize changes in land use management practices for achieving local, national and global environmental benefits.

II. PROJECT AREA

II.1. The project would be nationwide.

A. Topography, Climate and Soils

II.2. More than two–thirds of Uganda lies at altitudes ranging from 1,000 m–2,500 m above sea level. The relatively high altitude has led to many areas in Uganda being badly eroded while others are at risk of having their soils permanently destroyed unless prompt and proper action is taken. Most of the areas experience bimodal rainfall (except the northern areas with one long season) with the first rainy season extending from March–May and the second rainy season from September–November. Although Uganda is usually considered as well endowed with water resources, seasonal and spatial variability causes specific problems, as the country has both humid and semi–arid areas. There are not only differences between distinct wet and dry years, but there are also considerable variations in the timing of the onset of seasons and the amount of rainfall in the stream flow. Dry areas, receiving less than 1,000 mm of annual precipitation, occupy 26% of the land (Karamoja area being dominant), and the majority of the country receives 1,000 mm–1,750 mm. Rainfall is greater than 1,750 mm in only 4% of the country. Lying astride the equator with high temperatures and high annual rainfall, Uganda experiences intensive weathering, leaving soils prone to degradation.

II.3. Average temperatures range from 14 C–18 C in the highlands to almost 27°C in the lowlands. The dominant soil types are sandy clay loams (largely ferralitic), with heavier clay soils in valley bottoms. There are clear indications of soil erosion throughout the country, especially in the

highlands of the eastern and south–western regions, resulting in gulleys in many places and an overall decline in fertility in the country’s once highly–productive soils. This is more pronounced in the west than in other areas. Deforestation, mainly from cutting trees for fuel wood and construction, is a serious problem. This has adverse implications on fuelwood supplies and the environment as a whole.

B. Population

II.4. The last comprehensive population and housing census was undertaken in 2001. The total country population is estimated at 25 million people with average density estimated at 103 persons/km². Population densities are highest in the districts around Lake Victoria and in the highlands of the southwest, the country’s most fertile areas. The eastern region has the highest population density with an average of 143 rural persons/km² (535 persons/km² in Jinja district and 388 persons/km² in Mbale). The central region has an average of 100 rural persons/km², the western region has some 118 persons/km² and the northern region has about 49 persons/km². The districts with high–population densities coincide with good agricultural potential, high rainfall and consequently are most at risk of soil erosion. The natural soil erosion processes from climatic effects are now being compounded by many forces, among them human and livestock population pressure on the land. Some originally well–terraced hillsides, like Kabale, are now extremely eroded.

C. Agriculture

II.5. Over 85% of Uganda’s population is rural and directly engaged in agriculture, with crops and livestock being the primary sources of income. Livestock producers are found mainly in the western regions. The major production tool is the hand–hoe with animal traction (oxen) used mainly in the eastern region. Large–scale farms are limited, with subsistence production (on an average of 2.2 ha) dominating. Uganda’s agriculture is characterized by low–input/low–output technologies with very low usage rates of purchased inputs like improved seeds, fertilizers and pesticides. Crop yields are therefore low and have remained either stagnant over a long period of time or have only slightly increased and have not kept pace with growth in population. Uganda had an overall positive food balance in the past; per capita food production is on the decline mainly because of rapid population growth (3%), which is higher than the growth in the food production rate (estimated at 1.5%). This therefore poses a strategic problem of food insecurity. Land pressure has decreased the possibility of restoring productivity by allowing the land to lie fallow. Labour shortages and focus on market commodities hinder the adoption of soil nutrient restoration strategies. As urbanization increases, so does the efflux of nutrients from the farms. Modernization of agriculture will also invariably mean more intensive cropping and higher yields per unit area according to expectations, as well as sedentarization and intensification of livestock production. In addition, inappropriate farming techniques (e.g. soil disturbance and compaction through tillage, cultivating vertically up and down the slope, and lack of soil conservation structures such as perennial field borders and lines/strips, grassed bunds, and reduced soil organic matter and soil cover) expose the soil to agents of soil degradation. Therefore, soil and water management will have to substantially improve for the country to increase and sustain agricultural production.

II.6. The major food crops are bananas, cereals (maize, sorghum, finger millet), root crops (sweet potatoes and cassava), pulses (beans) and oil crops (groundnuts and soybean). The traditional cash crops are mainly coffee, cotton, tea and tobacco, and the dominant fruits and vegetables are pineapples, passion fruits, tomatoes, onions and cabbages. In recent years, cut flowers (mainly roses that are intensively produced) and spices are being grown for export. Agricultural advisory services are offered by both private and public sectors.

D. Infrastructure and Social Services

II.7. Health services are still limited and concentrated in urban centres. There is a serious shortage of drugs and basic medical equipment. The government target is to have a fully equipped health centre at each subcounty level. Private clinics have increased in recent years and offer reasonable first-line treatment to rural populations. The main human health problems are malaria, TBC, typhoid, internal parasites and HIV/AIDS. Poor access to health centres exacerbates the problem of rural health care. All-weather roads are few and their maintenance is not regular. During rainy seasons, many parts are not passable with ordinary means of transport. A reasonable number of both private and public schools exist. However, many of them are characterized by inadequacies in buildings and basic equipment and high teacher-to-pupil ratios. .

E. Social Setting

II.8. The people of Uganda come from diverse backgrounds and are ethnically different with distinct dialects. Strong social cohesion in the project area is characterized by continuity of the cooperative structure (existence of a number of registered primary societies is documented), though some people have not joined them because they have had bad experiences with cooperatives in the past. This is further supported by the emergence of unique grassroots rural producer organizational (RPO) structures, some with the assistance of and based on the NAADS approach of farmers’ forums at the subcounty levels that provide an excellent framework for development activities. The strengths of these RPOs are seen in their capacity to handle a range of activities including environmental protection, ability to access advisory services, production credit and quality and reasonably priced inputs through bulk purchases. They also are able to bulk their marketable farm products and thus be able to negotiate prices and other terms of trade with the buyers. The organization of Farmer Field Schools (FFS) to address specific constraints and opportunities identified by farmers’ groups is enhancing their adaptive management and decision-making capacity and access to support services. The FFS provide a conduit for accelerating farmer learning and adoption of improved natural resource management.

III. PROJECT RATIONALE

III.1. Natural resource utilization and management fits well into the priorities of GoU in its plans and strategies to implement the PMA and PEAP. The sector is consistent with the NEPAD and CAADP (Pillar 5) initiatives of addressing agricultural crises in Africa.

III.2. As the full extent of environmental degradation — partly exhibited by reduced soil productivity from nutrient depletion, water deficits for crop production and deforestation — have been realized, natural resource management has been given priority by GoU and its development partners. According to the NEAP, the country’s annual rate of deforestation is 500 km²; FAO has estimated the rate at 650 km². In 1890, 45% of Uganda was covered with forests and woodland (about 10.8 million ha), but by 1967, the forest cover had reduced to only 14%. Forest cover in Uganda today is estimated at less than 6%. The main cause of deforestation in Uganda is the uncontrolled harvesting of timber, wood fuels, non-timber products and encroachment of cultivation of agricultural crops into forests as a result of population pressure. Consequently, it has become vital to identify appropriate land-use approaches for the production of multipurpose outputs, and to ensure the sustainability of the production base.

III.3. Agroforestry, which integrates multipurpose tree production with crops and/or animals, is an opportunity to take pressure off the remaining natural forests. Such mixed systems are common in traditional smallholder farming, but these have been often superseded by a focus on market commodities. The design and development of adapted mixed crop–livestock systems and agroforestry systems building on valuable, indigenous species will:

- increase agricultural biodiversity and resource–use efficiency, including *in situ* conservation of genetic resources;
- contribute to stable climates;
- reduce soil erosion;
- control drought and desertification; and
- provide raw materials for construction, wood, furniture, charcoal, paper, animal feeds and pesticides among other things.

III.4. At present there is a high demand for seed for agroforestry and cover–crop species but organized seed supply is virtually non–existent. An adequate supply of viable seed produced locally and/or delivered on time for planting efforts, backed up by information and technical advice, is a prerequisite for uptake and adaptation to different farmer contexts.

III.5. The country’s once highly productive soils are increasingly being threatened by serious environmental degradation. Undisturbed and well–managed soils are balanced assemblages of mineral particles, organic matter and living organisms existing in a dynamic equilibrium. However, with continuous tillage, loss of organic matter and exploitation of nutrients, their biophysical and chemical characteristics will deteriorate, affecting soil life and critical functions that a wide range of soil organisms perform from maintaining porosity to cycling nutrients and controlling pests and diseases. Tropical soils are particularly vulnerable, and some of the soils are already being degraded on a massive scale because of unwise human use and activities, while others are potentially at risk of undergoing permanent damage.

III.6. Notable among the areas where the situation is becoming precarious are (i) the over–utilized soils in the districts of Karamoja, Mbarara and Nakasongola; and (ii) the heavily utilized soils in Rukungiri, Mbarara, Rakai, Masaka, Bushenyi, Iganga and Nebbi districts. Although soils in many other areas of the country remain moderately or lightly utilized and some are under–utilized, the soil situation in most of the Ugandan districts warrants urgent attention to complement the efforts provided by district conservation by–laws. There are an increasing number of proven and promising soil and water management technologies that enhance optimal utilization of land for agriculture. These include conservation agriculture practices that combine minimum tillage with cover crops and rotations, contour cropping, terraces, minimum tillage and use of soil amendments like biofertilizers, retention ditches, trash lines and agroforestry. However, the inadequate dissemination of these technologies remains a significant constraint to soil and water conservation efforts.

IV. PROJECT OBJECTIVES

IV.1. The *overall objective* of the project is to contribute to increases in sustainable agricultural production through the promotion and adoption of farming systems and land–use practices that would conserve and enhance land productivity in an environmentally–sustainable manner, thus increasing food production, income generation and provision of shelter and energy to farmers and society as a whole.

IV.2. The *specific objectives* of the project are to:

- Promote private sector participation in setting up and maintenance of demonstrations of on–farm integrated soil fertility management technologies that will improve the productivity of soils on a sustainable basis through integrated organic matter and plant–nutrient management.
- Promote demonstration and dissemination of proven, affordable and promising water catchment technologies (like terracing, retention ditches, trash lines, soil and grass bunds) that enhance optimal utilization of rain water by the farmers concerned.
- Promote agroforestry and plantation forestry as integrated systems of land management that involves the production of trees, crops and livestock on the same plot of land in order to improve wood production and provision of other benefits from growing wood plants and contribute to the rehabilitation and conservation of a degraded environment.
- Support efforts that are geared towards promotion of alternative energy sources to fuelwood in order to reduce the rate of encroachment on forest and plantation trees for domestic and commercial use.

V. PROJECT DESCRIPTION

V.1. The project will run for five years and is composed of three components.

Component 1: Soil and Water Management, Productivity Improvement & Conservation

V.2. Under this component, the project will aim at improving and sustaining soil and water management at farm level. The rationale is to enhance infiltration, water capture, nutrient recycling and reduction in runoff and erosion. In each of the 56 project districts, MAAIF will work with the local governments and the private sector to identify at least two suitable locations in every subcounty that will serve as demonstration models for this activity. Districts with more pronounced soil fertility problems will be given an opportunity to have more than two sites in a subcounty.

V.3. The criteria for selection will be farmer proof of ownership of the piece of land and capacity to keep relevant records, farming and soil conservation experience, knowledge and skills acquired over the years and enthusiasm to maintain the demonstrations. The identified farmers will undergo sensitization and capacity–building training to ensure that they are aware of the objectives of the project and the need to maintain and disseminate the acquired knowledge to a wider community. A total of 2,000 pilot demonstration sites (of about 2 ha each) totalling about 4,000 ha nationwide will be established.

V.4. The component’s activities will include:

- **Support for the establishment of scientifically proven and indigenous biological soil conservation techniques** like use of bio-fertilizers (like *rhizobia inoculum*), use of locally available organic materials (like composts made of plant and animal residues) and the promotion of alley cropping, intercropping, contour cropping, minimum (reduced or conservation) tillage concepts and soil improvement by the use of leguminous cover crop species like mucuna. An integrated approach, where applicable, will be adopted and integration of crop-livestock systems will be promoted. Aspects of soil fertility management options will include timing, costing, maintenance and estimates of the quantitative financial and economic benefits of their application. Gully control activities in areas with very steep gradients will be instituted by constructing check dams and by popularizing vegetative controls using grasses like Napier and Setaria (that can also be used for animal fodder). Visible comparisons of the benefits of using one of more of the packages will be demonstrated. Use of inorganic fertilizers that are well formulated and add specific highly concentrated nutrients will be encouraged through complementing of *Soil Fertility Initiative* (SFI) activities. These farmers will serve as *Extension Link Farmers* to the other farmers in the community, giving priority to women and the youth.

The project will further support the selection and facilitation of 280 private-sector service providers (5 in each district), to assist in initiation and setting up of these sites. The project will also support the formation and promotion of 280 Farmer Field Schools (3 in each district) as these institutions have been proven to be effective in technology dissemination. At least 560 field tours and visits (2 per FFS) will be organized. In order to bridge the gap between research and field demands and experiences, the project will support documentation (multilingual) of practical approaches and tools to guide farmers and professional field staff on identifying nutrient deficiency symptoms of common crops and the basic mitigation measures which could be undertaken without rigorous scientific analysis. This will be done in collaboration with the Department of Soil Science, Makerere University, NARO and the private sector.

- **Land resources inventories, database development and land use mapping** will be given high priority and developed in collaboration with NEMA in order to effectively combat land degradation. Household nutrient resource flow analysis will also be conducted to provide a basis or guide policies for improved land management in Uganda.
- **Support will be given for the improvement in management of catchment water** to utilize rain water for crop production, reduce soil erosion and subsequent loss of nutrients in the topsoil from running water and also reduce landslides and floods. The technologies will be used to overcome the problem of moisture deficit experienced not only in the areas with perennial moisture deficits, like the northern and south-western parts of the country, but even in high-rainfall areas (e.g. Lake Victoria Crescent) during dry spells, as a result of high rates of evapotranspiration. These technologies will all be tested initially on a pilot scale and relevant data on aspects of cost of construction, maintenance, crop yields and prices will be collected for comparison and dissemination.
- **Demonstrate catchment water management technologies.** These will include crop and animal residues to mulch farm land, green manure, ditches and water retention holes 20 cm–30 cm deep which will be dug in soils that have been sealed by a surface layer and hardened by wind and water action. The holes are filled with organic matter and when it

rains the holes get filled with water and then farmers can plant crops. This technology has been tried out in Niger and Burkina Faso under IFAD intervention, with excellent results.

- **Support adoption of technologies to stabilize hillsides and other at-risk areas**, using contour grass strips, soil bunds, ditches, cover crops and terracing. These technologies have been tried out in many countries outside Africa, e.g. Honduras and Guatemala, and may provide excellent opportunities for capacity building and exchange of ideas and sharing experiences.

V.5. About 280 private-sector service providers will be supported under the component in training and materials. In order to encourage interaction and dialogue to share relevant and pertinent ideas and experiences, 10 seminars and workshops will be supported in each district during the project duration. Further, field tours by the participating farmers will be supported to improve their knowledge and appreciation of sustainable soil and water management techniques.

Component 2: Agroforestry

V.6. This component is subdivided into three subcomponents, namely *Agroforestry*, *Plantation Forestry* and *Alternatives to Fuelwood and Energy-saving Technologies*.

- **Agroforestry.** The major focus of the forestry reforms has been to reduce deforestation and contribute to the eradication of poverty. In this context, sustainable natural resource management to improve rural livelihoods has been central. Forestry needs to be integrated into agriculture. Among the planned PMA interventions is the inclusion of farming/agroforestry in agricultural advisory services in the NAADS strategy. The project will contribute to the strengthening of this NAADS strategy to ensure that the relevant capacity is developed. Since the development of decentralized *District Forestry Services* (DFS) is particularly critical to the PMA, the project will support the formation of 56 DFSs, one per district. These will, among other responsibilities, be charged with mobilization of funds (e.g. from district-based forestry grants) to encourage tree growing in the public interest in environmentally sensitive areas such as hillsides and riverbanks. Urban authorities will be strengthened to ensure increased tree growing in urban areas. This will involve promotion of greening urban environments, through better urban planning, mobilization of building contractors and other businesses, setting standards for urban nurseries and organizing advice and training support.

The private sector will be encouraged to strengthen business skills and take a more active role in investment in and management of trees. They will be encouraged to undertake growing of particular tree species, raise seedlings for wood and non-wood products for commercial purposes and acquire skills in proper harvesting, processing and marketing of timber products. A number of private sector initiatives have been undertaken; these provide opportunities that can be built upon. The project will equip 3,000 private tree nursery operators at subcounty level throughout the country with knowledge and skills; they will be supported in terms of provision of suitable seeds/planting materials, and where possible, with inputs like nursery nets, to undertake commercial multiplication of the demanded tree species of improved genetic quality to ensure that planting material is readily accessible all year round. This will necessitate obtaining information and documentation on seed requirement and supply levels and tree species demanded. In order to improve and effect more efficient use of tree seeds in Uganda, training and access to information will be supported.

Besides the private sector, 4 government nurseries, one in each region of the country, will be supported, partly in order to fill the gap in supply of seedlings, in case of any production shortfalls by private sector nursery operators.

- **Plantation forestry.** The project will encourage plantation forestry, particularly by the private sector. Interest in plantation forestry has continued to grow as a result of factors favouring its development and the problems with the natural forest resource. The silvicultural, economic, social and environmental benefits that make plantation forestry attractive are evident. These include the ability to grow rapidly both in relative volume and value, achieved through proper site selection, manipulation of spacing, thinning regimes and rotation length to produce a desired mix of timber sizes, poles, pulpwood and sawn timber. The establishment of industrial, pole and fuelwood plantations is, however, a recent development and has benefited greatly from a number of exotic tree species introduced around 1912, including *Pinus* spp, *Cupressus* spp and *Eucalyptus* spp among others. The project will support the private sector to set up 2,000 ha of softwood timber or coniferous forest plantations of *Pinus* spp and *Cupressus* spp, and 2,000 ha of pole or fuelwood plantations of *Eucalyptus* spp. The private sector will also be assisted in setting up timber processing facilities to add value.
- **Alternatives to fuelwood and energy saving technologies.** In order to reduce the rate at which trees are used for fuel, alternatives to fuelwood for domestic and industrial use will be sought. Efforts of the *Joint Energy and Environment Project* (JEEP) and the *Kawanda Agricultural Research Institute* (KARI) will be complemented and will provide some basis for further work. Support will also be provided to undertake work on energy-saving technologies such as stoves, as a step towards reduction in the fuelwood utilized under normal circumstances.

V.7. The above three sub-components will necessitate support for formation, strengthening and assistance to farmers' associations (FAs) in skills empowerment of members and in setting up revolving funds for ensuring sustainability of the introduced technologies. A total of 100 FAs will be assisted. The *National Forestry Authority*, FORRI, NEMA and NAADS will be supported through capacity building and logistics so that they can play their rightful roles for the accomplishment of the project objectives.

V.8. Investment opportunities in plantation forestry have been identified in the following areas;

- planting softwoods for timber and poles;
- planting softwood for pulp;
- value-added products from both hard- and softwoods;
- manufacture of furniture and related products;
- promotion of eco-tourism and agroforestry;
- planting palm trees and processing palm oil; and
- planting medicinal plants.

V.9. The project will encourage up to 50 foreign investors to invest in these enterprises.

Component 3: Project Coordination

V.10. The project will, as far as possible, work within the existing structures of MWLE, the private sector and farmers’ organizations. However, for coordination purposes, a small unit will be set up in MWLE with a coordinator, support staff and equipment. Liaison offices will also be established in each of the project districts.

VI. INDICATIVE COSTS

VI.1. The project will cost about US\$31.5m over a 5–year implementation period. The Table below gives the indicative estimated costs per component. About 79% of the cost will be in local costs and 21% will be in foreign exchange. The costs have been derived from reports that have outlined similar project components. Where information is limited and/or lacking, professional estimations have been used, basing on prevailing market prices.

Cost Summary by Component					
Component (amounts in US\$000)	Local	Foreign	Total	% Foreign exchange	% Total base costs
1. Soil and Water Management	7,274	3,656	10,930	33	46
2. Agroforestry	8,778	975	9,753	10	41
3. Project coordination	2,300	851	3,151	27	13
Total baseline costs	18,352	5,482	23,834	23	100
Physical contingencies (*)	1,835	548	2,383	23	10
Price contingencies (**)	4,588	658	5,246	13	22
Total Project Costs	24,775	6,688	31,463	21	132
(*) A 10% factor has been included in the data to cater for civil, electrical and plumbing works contingencies.					
(**) Estimated at 5% for local prices and 2.4% for foreign costs.					

VII. PROPOSED SOURCES OF FUNDING

VII.1. GoU, development partners, the private sector, NGOs and the beneficiaries will finance the project. The GoU will provide US\$6.3m (20%) of total project financing; the donors/IFIs will provide US\$12.6m (40%); the beneficiaries will provide US\$3.1m (10%); and the private sector will contribute US\$9.4m (30%) of total funding.

VII.2. Among development partners , interest in funding environmental projects has been demonstrated mainly by USAID (through its upcoming programme called APEP and the on–going support to the FEWS–Net project); Denmark, EU, Norway (NORAD is currently promoting producer associations and training at Makerere University and would be interested in funding these aspects of this project); Netherlands , IUCN, GEF, UNDP, SIDA and IDA among others. These have largely funded past and ongoing projects in the area of the environment and would likely contribute to project funding through grants, soft loans and technical support.

VII.3. The private sector, through PSF and UNCC, may be mainly interested in financing agroforestry and plantation forestry. They have shown interest in funding particular training programmes at Makerere University and sponsored a number of short–term courses for their members and also held workshops and seminars.

VII.4. A number of NGOs and associations are working on many aspects of environmental sustainability. These include JEEP, VEDCO, CARE International, CIAT, Africa 2000 Network among others, which have been key partners in developing, adapting and disseminating appropriate soil conservation technologies. These organizations will be willing to finance some capacity building activities of the project.

VII.5. The beneficiaries will finance some aspects of the project through contributions in form of land, cash and labour or both. This will call for sensitization of beneficiaries prior to full-scale project implementation in order for them to value the project as their own.

VIII. PROJECT BENEFITS

VIII.1. The main benefits anticipated from the project are:

- Higher crop yields on smallholder farms because of enhanced soil fertility. About 1,000 farmers (with a total area of 2,000 ha) will be empowered to set up soil management options demonstration sites. Vulnerable groups (women and youth) will be targeted in particular.
- Increased farmer awareness about scientifically proven and indigenous soil and water management techniques like the use of bio-fertilizers, composts, alley cropping, contour cropping, minimum tillage and soil improvement by use of leguminous plant species and crop-livestock integration in farming (including zero-grazing), will be set up for demonstration on 2,000 ha. This will necessitate provision of 1,000 dairy animals to the beneficiaries for purposes of nutrient recycling.
- 56 DFS units will be formed with the responsibility of mobilization of funds and formulating policies and setting standards for nursery operators in order to improve agroforestry.
- 3,000 private tree nursery operators will be facilitated to improve their business and tree-husbandry skills in order to play a more active role in tree management.
- 280 private-sector service providers will be recruited and facilitated to undertake project activities.
- 280 FFS will be formed and/or strengthened to undertake and promote project activities.
- 100 Farmers’ Associations will be formed and/or supported to undertake and promote project activities.
- 1,120 agroforestry technology demonstrations will be set up.
- 2,000 ha of coniferous tree plantations and 2,000 ha of fuelwood/pole tree plantations will be set up during the duration of the project.
- Two public institutions (NEMA and NFA) will be strengthened to develop promising and easy-to-adopt fodder, wood and fruit-based technologies.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. Since natural resources and the environment are the mandate of the MWLE, the ministry will be the lead implementing agency and will be responsible for the overall policy guidance, intersectoral project coordination, planning and reporting of project activities. At the headquarters of MWLE, a *National Technical Committee* — composed of representatives from the Department of Water Development, NFA and NEMA, responsible for technical guidance and reporting to the Permanent Secretary — will be formed. It will be responsible for project level planning, procurement, coordination, monitoring and evaluation, sensitization, technical backstopping and accountability. The Technical Committee will be assisted by a *National Project Coordinator* who will be responsible for the day-to-day running of the project. Some functions will be shared between MWLE and other ministries and institutions like MUK and NARO. Specifically, the *Soil and Water Management Component* of the project will be under MAAIF, while the *Agroforestry Component* will be under MWLE.

IX.2. The decentralization process has given greater authority to local governments at district and subcounty levels to plan and implement programs with participation of residents to make development relevant to their needs. At district level, CAOs will be the project coordinators. Work at this level will be managed by technical committees that will be headed by *District Environment Officers* (DEOs). At the subcounty level, LC3 chairpersons will be responsible for project activities. Local governments will be responsible for supervision of project activities. In partnership with local and external stakeholders including NGOs, CBOs and the private sector, they will plan and design implementation arrangements including financing and delivery of agricultural services. They will also play a role in sensitization, training, monitoring and evaluation and accountability.

IX.3. The private sector will be responsible for identification of supplementary funding sources, sensitize the masses about employment opportunities created by the project and capacity building. It will also, through competitive bidding, be involved in direct delivery of public services to farmers on a commercial basis. This will involve the supply of materials like seeds, equipments like computers, and vehicles, and provide the required services for construction of physical infrastructure like valley dams and delivery of services to farmers on a commercial basis. The sector will also work with MWLE and MAAIF to identify potential project participants and also get involved in all the stages of planning, monitoring and evaluation.

IX.4. Civil society, (NGOs, CBOs, professional bodies and associations) will be involved in the process of designing and managing the project, carrying out project activities like capacity building and delivery of services based on their field experiences, and sensitization and identification of supplementary funding. The development partners will contribute funding, participate in designing disbursement and accountability mechanisms and provide technical guidance during project implementation. The farmers will provide the land, indigenous knowledge, basic infrastructure and labour (and in some instances food) required for the execution of project activities.

IX.5. Prior to implementation, a detailed feasibility study will be required to participatorily design the project in detail and estimate its financial and economic implications in the project areas and the country in general.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. Local and foreign technical assistance needs are foreseen in the areas listed below:

- Soil science to harmonize the existing scientific and indigenous packages and find appropriate packages that will be used to set up demonstrations on soil conservation.
- Environmental issues in collaboration with NEMA.
- Forestry expertise (with specialization in agroforestry) for the purpose of providing technical guidance to the project activities in farm and plantation forestry.
- Forestry Economics to undertake farm management, production, marketing and benefit–cost analysis in order to quantify the impact of the project interventions.
- Agricultural engineering to assist in the design and setting up of catchment water management technologies.
- Identifying alternatives to fuel wood as options that can reduce domestic and industrial use of tree products, in order to reduce forest degradation.
- Business expertise to impart various business skills to tree nursery operators to enable them to undertake commercial tree seedling production.

X.2. Estimated duration of individual assistance will be worked out during detailed project formulation.

XI. ISSUES AND PROPOSED ACTIONS

XI.1. Below are some outstanding issues as well as proposed actions that could be taken in mitigation.

XI.2. **Public Budget Ceilings.** Within the framework of the PEAP processes, GoU prepares *Medium–term Expenditure Frameworks* (MTEF) which help government to set sectoral budgetary ceilings for public expenditure in a given year. The MTEF therefore tries to ensure medium–term financial and macro–economic stability by coordinating the allocation of all public spending — government and donor funds — within a unified framework that ensures consistency with overall resource constraints. These ceilings can sometimes be a bottleneck as they limit some sectors from being able to access more funds for their development, if there is justifiable need to exceed the set ceilings.

XI.3. **Inadequate Capacity.** There is inadequate technical and logistical capacity with the departments of MWLE and MAAIF which will implement the project. There is also inadequate managerial, technical and logistical capability at the lower governance levels (district and subcounty). Decentralization has been accomplished very rapidly and has led to some capacity gaps. Their combined impacts are hindering the satisfactory implementation, completion and monitoring and evaluation of development projects. A remedy would be training, temporary technical assistance and provision of logistical support, particularly in the field.

XI.4. **Land–use Policy.** The formulation of the land–use policy is still going on, yet it is crucial in the soil conservation and water development components of the project because farmers and entrepreneurs are less likely to invest in long–term natural resource management activities if they are not, for example, assured of their long–term ownership of the land. The process of the approval of the Land bill and its implementation therefore needs to be accelerated.

XII. POSSIBLE RISKS

XII.1. Major risks include:

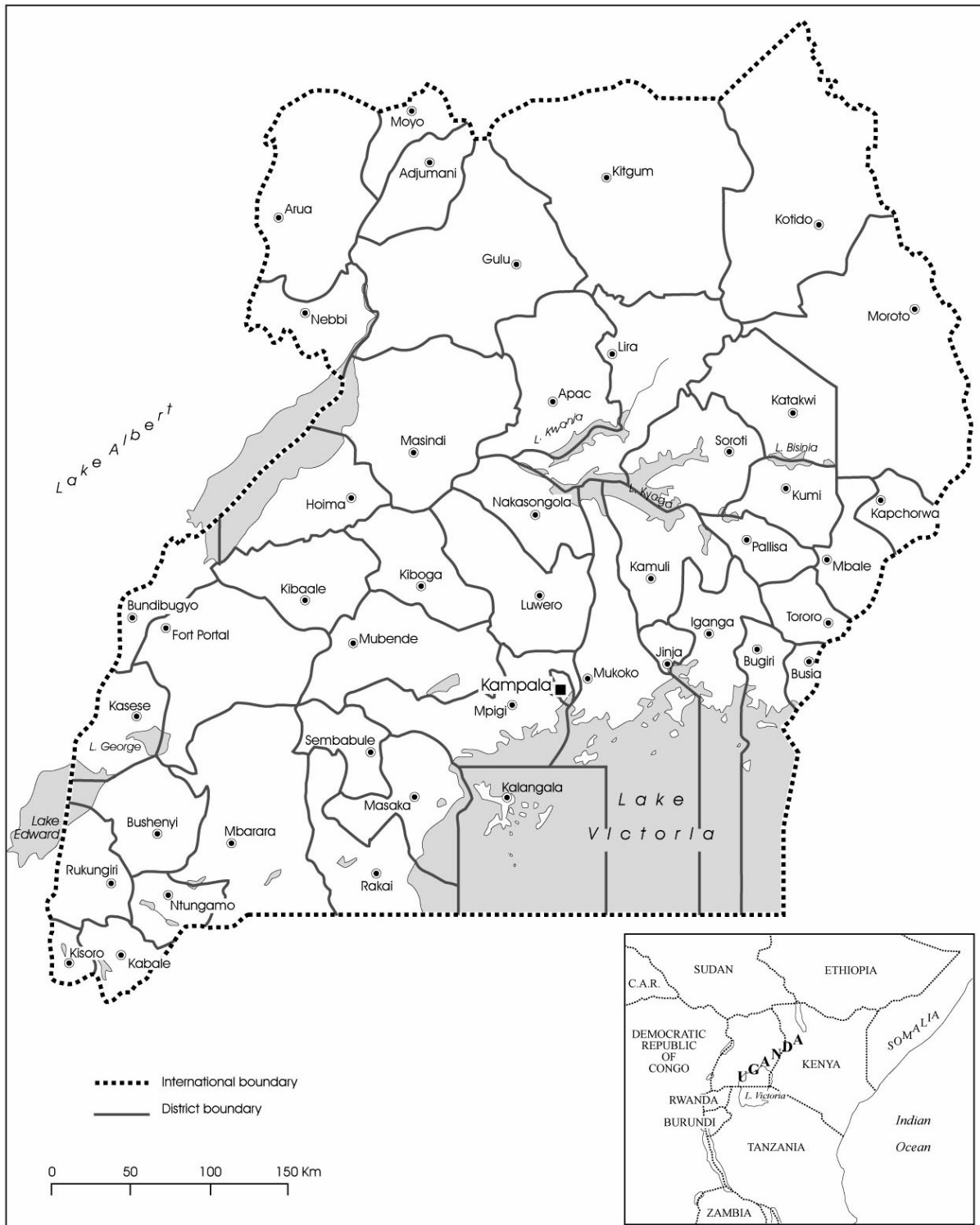
- ***Political Instability.*** The current civil strife in the northern and some parts of the eastern parts of the country will undermine development activities if the rebel activities spill into project areas.
- ***Inadequate Advisory Services.*** The project beneficiaries may not be able to have sufficient access to advisory services in undertaking the new technologies and innovations that the project will promote. The NAADS framework is still relatively new and does not cover the whole country. This could lead to low offtake and poor implementation of project activities.
- ***Implementation Delays.*** Delays in implementation of a number of previous projects have been registered in various institutions. While some of the delays may be attributable to factors beyond the scope of the projects, many were due to bureaucratic red tape in the implementing institutions, and might similarly jeopardize the implementation schedule of the proposed project. Innovative and flexible project management coupled with decentralized decision-making could help to minimize this risk.
- ***Unpredictable Public Financing.*** GoU has not been in position to fulfill its counterpart financing for some projects in the past because of a shift in priorities and shortfalls in anticipated revenue levels. The timing and predictability of the flow of funds could disrupt planning and timely implementation of the project. To help minimize such a risk, the project proposes reasonable cost-sharing and cost-recovery by farmers rather than over-dependence on government. Farmer access to micro-finance institutions for borrowing is another avenue although it is limited.
- ***Unenthusiastic Farmer Participation.*** Investments in environment and natural resource management ventures tend to have long gestation periods and tangible economic returns tend to take relatively long periods before they are realized. Farmers may not be willing to undertake such activities if the opportunity cost in investing in them is high. Sensitization and training about the long-term benefits of natural resource conservation should go a long way in alleviating this risk.

ANNEXES

Annex 1: Uganda Administrative Map

Annex 2: References

Annex 1: Uganda Administrative Map



Annex 2: References

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