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 KINGDOM OF SWAZILAND

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume II of VI

BANKABLE INVESTMENT PROJECT PROFILE

Multipurpose Earth Dams Construction and Rehabilitation Project

February 2005

SWAZILAND: Support to NEPAD–CAADP Implementation

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NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Swaziland

Sector of Activities: Irrigation and Land Management

Proposed Project Name: **Multipurpose Earth Dams Construction and Rehabilitation Project**

Project Location: Lower Middleveld and Lowveld

Duration of Project: 4 years

Estimated Cost:

Foreign Exchange..... US$4.5 million
Local Cost ..... US$0.7 million
Total..... US$5.2 million

Suggested Financing:

Source	***US$***	***% of total***
Government	524,100	10
Financing institution(s)	4,454,850	85
Beneficiaries	262,050	5
Private sector	–	
Total	***5,241,000***	***100***

SWAZILAND:

NEPAD–CAADP Bankable Investment Project Profile

"Multipurpose Earth Dams Construction and Rehabilitation Project"

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Abbreviations

CAADP	Comprehensive Africa Agriculture Development Program
CBO	Community–based Organisation
DFID	Department for International Development (United Kingdom)
EIA	Environmental Impact Assessment
GDP	Gross Domestic Product
GOS	Government of Swaziland
HDI	Human Development Index
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
LUPS	Land Use Planning Section [of MOAC]
NEPAD	New Partnership for Africa's Development
NDS	National Development Strategy
NGO	Non–governmental Organisation
NMTIP	National Medium–Term Investment Programme
MOAC	Ministry of Agriculture and Cooperatives
SEAP	Swaziland Environment Action Plan
SNL	Swazi National Land
VAC	Vulnerability Assessment Committee

I. PROGRAMME BACKGROUND

A. Programme Origin

I.1. The *Multipurpose Earth Dams Construction and Rehabilitation Project* is a new project that builds on from previous similar projects implemented by the *Ministry of Agriculture and Cooperatives* (MOAC) with funding support from the European Commission and others from 1989 to 2000.

I.2. The proposed project is demand driven by communities in the drier areas of the country where both drought and poverty are prevalent and livelihoods continually threatened by water and food insecurity.

I.3. The achievement of food security in the country continues to be the primary goal of the agricultural sector in Swaziland. In recent years, there has been a growing realization that concerns for food security at the aggregate level should move to a concern for food security at the household level. Continued economic and political developments in the country have prompted a review of the strategies and roles of various stakeholders in the agricultural sector that work in close collaboration in achieving food security objectives. Food security should not be looked at as just a supply issue but also as a function of income and purchasing power and hence its strong relationship with poverty.

I.4. A typical household is classified as being food secure when all of its members have adequate access to sufficient quantities of food to ensure an active and healthy life at all times, whether through home production or purchase. Therefore, food security is achieved by:

- Having enough food present at all times in the household;
- Household having the means for obtaining that food;
- Individuals consuming a sufficient and balanced diet, and
- Assurance that the first three conditions are met.

I.5. One way to break the vicious circle of poverty and food insecurity is to increase agricultural productivity, particularly where small farmers who are often amongst the poorest, can achieve gains. As the country's population and living standards rise, the demand for food will grow, and the availability of arable land will continue to decrease. Land under food production has been continuously subdivided to accommodate a growing rural population. Therefore, it is considered important to intensify production on land with agricultural potential currently in use, using sustainable methods, rather than to encroach on land that is only marginally suitable for cultivation. The use of dams to provide water for this increased agricultural productivity remains an important focus of the Government of Swaziland (GOS).

I.6. The GOS has given high priority to the further development of multipurpose dams in the drier areas of the country. In the GOS *National Development Strategy for Agriculture*, the reduction of poverty, increased agricultural productivity and irrigation have all been given a high priority and the availability of water storage will contribute towards these national goals.

I.7. The *New Partnership for Africa's Development* (NEPAD), which aims to "*eradicate poverty in Africa and place African countries, both individually and collectively on a path of sustainable growth and development*", clearly acknowledges that a healthy and productive environment is a pre–requisite for Africa's development. The government and people of Swaziland, like many other countries in Africa, are determined to reduce poverty and increase livelihood sources for rural people, hence the development of the *Swaziland Poverty Reduction Strategy* in 2001. The Strategy

underscores the need to safeguard the natural environment to ensure long–term growth and development, and advocates for implementation of policies that prevent further environmental degradation and ecosystems losses. There is clearly a huge potential for integration of natural resource management with rural development initiatives to generate wealth and ensure the healthy environment that will contribute to sustainable development.

B. The CAADP/NMTIP Linkage

I.8. In April 2004, Swaziland initiated the preparation of her *National Medium–Term Investment Programme* (NMTIP) for agriculture under the *Comprehensive Africa Agriculture Development Programme* (CAADP). The preparation of this report, carried out by national consultants, was consultative and guided by a CAADP *Steering Committee* composed of government officers, NGO and private sector representatives. Priority areas for intervention were identified and four priority project areas were agreed upon at a *National Stakeholder Workshop* in July 2004.

I.9. The five priority areas were:[1]

- Promotion of sustainable feed and fodder production and utilisation (related to CAADP Pillar 3, and crosscutting to Pillars 2 and 5).
- Promotion of value–adding activities in agriculture (related to CAADP Pillar 3, and crosscutting to Pillars 2 and 5).
- Resuscitation of Mfumbaneni hatchery (related to CAADP Pillar 3, and crosscutting to Pillars 2 and 5).
- Community–based natural resources and land management (related to CAADP Pillar 5, and crosscutting to Pillar 3).

C. General Country Information

I.10. Swaziland is a landlocked country with a land area of approximately 17,364 square kilometres that is divided into six agro–ecological zones based on elevation, topography, climate, geology and soils: Highveld, Upper and Lower Middleveld, Western and Eastern Lowveld and Lubombo Range. Swaziland has a subtropical climate with summer rains (75 percent in the period of October till March) and distinct seasons. All regions receive a distinct seasonal rainfall, most of which falls in summer (September to March), whilst little or no rain is expected over the other months. The climatic conditions range from sub–humid and temperate climate in the Highveld to semi–arid climate in the Lowveld.

I.11. Swaziland has a population of 1.01 million as per 2002 of whom 73 percent live in rural areas. Its gross domestic product (GDP) per capita in 2002 was US$1,180 and it is ranked 133 out of

[1] The CAADP Pillars are:
1. Expansion of the area under sustainable land management and reliable water control systems.
2. Improvement of rural infrastructure and trade–related capacities for improved market access.
3. Enhancement of food supply and reduction of hunger.
4. Development of agricultural research, technological dissemination and adoption to sustain long–term productivity growth.
5. Sustainable development of livestock, fisheries and forestry resources.

the 175 countries covered by the United Nations Development Programme's (UNDP) Human Development Index (HDI). The World Bank classes Swaziland as a Lower Middle Income Less Indebted country. However, per capita income of the poorest 40 percent of the population is only US$230, and 66 percent of the population live below the poverty line (defined at US$1 per day). The income distribution is skewed, as about 43 percent of the total income is received by only 10 percent of the population.

I.12. The agricultural sector's share of GDP decreased from about one–third at independence to 13.6 percent (average for the period 2000–2002). However, agriculture remains an important source of livelihood for over 70 percent of the population and most households derive a substantial part of their income from agriculture, either as small–scale producers or as employees of the medium– and large–scale farms and estates. The sector, including agro–based industries, is also an important foreign exchange earner, accounting for about 45 percent of the value of national exports. Sugar cane accounts for 60 percent of agriculture's contribution to GDP. The growth of real per capita GDP fell from 6 percent in 1990 to a negative rate in 1991/92 during a severe drought. Another drought in 2001/02 resulted in a drop of 42 percent in maize production from the average.

I.13. The main problems facing agricultural production in Swaziland are limited investment, low inputs, marketing, land degradation, HIV/AIDS, drought and limited processing industries. Opportunities exist to develop the significant agricultural potential. Irrigation can be expanded and crop diversification towards more high value crops could be achieved, thereby creating opportunities for increased farmers' incomes. Past efforts to promote diversification have not been very successful, and it is felt that future efforts should not be limited to the introduction of improved production technologies, but should also focus on developing markets, marketing channels and rural infrastructure. The present rainfed farming practised in the SNL (see below), which is characterised by low productivity, also provides ample scope for improving the efficiency of the bulk of the farmers producing in this area.

I.14. Rural Swazis have very limited access to credit. What little financing is available usually comes from projects with donor–specific procedures or special credit programmes. In 1995 GOS established FINCORP (formerly the *Enterprise Trust Fund*) with an initial grant of E44 million to address the needs of small and medium enterprises by providing financial assistance, training and business advisory services.

I.15. The land tenure system in Swaziland can be divided into two major categories, namely communal land held in trust by the King, called *Swazi National Land* (SNL), amounting to about 75 percent of the area, and land under Title Deed (TDL), accounting for the remaining 25 percent. However, not all land under SNL is communally used: the MOAC, parastatals, leasing companies, etc. control about 31 percent.

I.16. The main land use in Swaziland is extensive grazing, of which communal extensive grazing covers approximately 50 percent of the country and commercial ranching 19 percent. Grazing takes places on natural grasslands, savannas and woodlands, which areas are also used for community forestry and natural resource extraction. Small–scale subsistence rainfed agriculture including grass–strips, homesteads and other infrastructure covers about 12 percent, whereas large–scale irrigated and rainfed crop production cover approximately 4 and 2 percent respectively. The latter is variable due to increases and decreases in cotton farming. In most years, a considerable part of the total arable land is fallow or temporarily unused. Plantation forestry including mills, firebreaks, tracks and other infrastructure covers about 8 percent and the remaining 5 percent is made up of national parks and urban areas. Cattle dominate the livestock sector in Swaziland, with a higher density of cattle on communal land than on private land. Numbers of cattle have always fluctuated as a result of drought,

but the general trend has been upward until a peak of 753,000 was reached in 1992, before the severe drought of the same year. Afterwards the number of cattle has settled at around 600,000.

I.17. Estimates of the total net arable land vary from 182,000 ha to 236,000 ha. Maize is the most important crop of the small–scale rainfed agriculture, covering about 70,000 ha of the total of 80,000 ha, in 2002 whereas sugarcane dominates the irrigated agriculture, covering about 45,000 of the total of almost 50,000 ha in 2002. The remainder 5 000 ha is mostly used by small holder, run of river irrigation and small off–stream storage schemes that do not exceed 10 ha individually. Swaziland normally imports cereals (maize, wheat and rice) estimated to be about 28 percent of national consumption needs. However, in the past four years there has been a significant fall in the self–sufficiency ratio with significant increases in the imports of wheat and rice.

I.18. The majority of the population live in farm households located on communal areas and are predominantly engaged in subsistence dry land farming. The main cause of the widespread poverty in Swaziland's rural areas is the large amount of labour that is devoted to low productivity rainfed crop farming and animal rearing. This has failed to provide the majority of the rural households with an adequate source of livelihood, thereby inducing them to survive with the help of non–agricultural employment and remittances from family members working in South Africa or the urban centres of Swaziland. Even then, there is widespread rural poverty, food insecurity and malnutrition. This is aggravated by the high incidence of HIV/AIDS and a degrading environment whose productivity is declining. The rural economy's reliance on subsistence agriculture is exacerbated by the low incentives to invest on communal SNL, which accounts for about 75 percent of all land, and the related but distinct issue of limited availability of commercial credit to finance such investments.

I.19. Nationally, access to safe water and sanitation has increased from 63 percent in 1980 to 80 percent in 1998. Access to safe water stands at 56 percent for the whole country with 37 percent in the rural areas and 91 percent in the urban areas. This inequality between the rural and urban sectors is typical for many socio–economic indicators with the rural populations worse off in many respects.

I.20. The condition of the main road network is generally considered as good with over 1,500 km with close to 1,000 km tarred. District roads, which are unpaved, stand at close to 2,000 km (71 percent of the total network).

I.21. The Swaziland bio–physical environment is rapidly changing as a result of increased natural resource utilisation, rapid population growth, industrialisation, urbanisation and increasing agricultural demands. Many of these changes are negatively affecting the natural environment. The GOS responded to this challenge by initiating the development of the *Swaziland Environment Action Plan* (SEAP) which was completed in 1997.

I.22. Swaziland has signed and ratified at least seven International Treaties or Agreements that directly affect biodiversity conservation and land management. These are: the *Convention on Biological Diversity*; the *United Nations Convention to Combat Desertification*; *United Nations Framework Convention on Climate Change*; the *Lusaka Agreement on Co–operative Enforcement Operations Directed at Illegal Trade in Wildlife*; *Convention on International Trade in Endangered Species of Wild Fauna and Flora*; the *Treaty on Plant Genetic Resources* and the *African Convention on the Conservation of Nature and Natural Resources*.

I.23. The current impact of the HIV/AIDS pandemic is exacting a very heavy burden on the population and the economy. The prevalence rate of HIV/AIDS is among the highest in the world and a rapid drop in the prevalence rate is not anticipated in the near future. Increasing rates of morbidity and mortality are exacting a huge toll on the ability of households to produce food and earn income

while at the same time increasing household expenditure on health and related costs. Children are particularly affected by HIV/AIDS with an increasing number of orphans and very vulnerable child headed households resulting from the over extended kinship networks. The cost to average household income of chronic illness has not been determined in Swaziland. The ability of Government services to respond to the problems has been eroded by illness and mortality of Government and private sector staff.

II. PROJECT AREA

II.1. The proposed project area covers the agroecological zones comprising the Lower Middleveld and Lowveld of Swaziland which are the drier parts of the country and experience regular water shortages. These areas cover approximately 7,790 km^2 representing approximately 45 percent of the country's land area (Appendix).

II.2. Preliminary site surveys have identified over 50 dams sites with potential for irrigation development. Reservoir volumes range from 5,000 m^3 to 40 000 m^3 from catchment areas of 2 to 9 km^2. With an average annual rainfall over the project are of 650 mm, catchments of around 3.5 km^2 can be expected to generate 2.3 Mm^3 of run off annually. Using a 5 percent run off factor, the water yield would be of the order of 115,000 m^3.

II.3. Recent NGO experience shows that a 'typical' dam with some key downstream infrastructure that includes an irrigated garden cost around E1,000,000 (US$170,000).[2] Based on a review of the costs associated with previous dams, total cost per cubic metre of water stored is in the order of E25/m^3 (approx US$4/$m^3$). For this a range of additional infrastructure can be included in a dam project including:

- *Irrigated Garden Development*, including design and installation of 1ha irrigation, fencing and training in group organisation, garden layout, marketing and business management and extended training in horticultural production (18 months).
- *Communal Laundry Facilities:* A standard 2 double sink laundry unit with water supply and water disposal, including soak–away.
- *Communal Shower and Standpipe*, with roof and water supply (no water disposal).
- *Catchment and Basin Fencing:* 2 km of 1.4 m 5 strand barbed wire fencing, with quality treated poles, metal standards, metal droppers, pedestrian gates and farm gates.
- *Garden Erosion Control:* Installation of lined drainage channels and upstream protection measures.
- *Catchment Erosion Control:* Implementation often involves installation of gabion baskets, stone and brush checks and vetiver grass technology where erosion channels have developed or are developing.
- *Cattle Trough Construction:* A 5m diameter circular reinforced concrete and sand cement block structure.

[2] Rate used: 1 US$ = E5.88 (Emalangeni).

- *Dam Maintenance Training:* For training to be effective it needs to be practical, tailored to the season and staggered. Training involves short course with reviews at the end of the following dry and wet seasons.

II.4. Locations for potential dams include:

Table 1: Preliminary dam sites identified			
Dam Site	Communities served	Dam Site	Communities served
Mhlosheni	Sandleni Ngozi Ngololweni Mabamba Hosea Ntabeni	Lubombo	Mdumezulu Khushweni Lubhuku New Thulwane Njobo Ntandweni Hlane
Sithobela	Mamisa Luhlanyeni Nkonjwa Makhwekhweti Themba Lavundlamanti Ngoni Gucuka Jija Mpompota Ekukhanyeni Nkonjwa Mamisa Nokwane Thuthuka	Plateau	Mambane Maphungwane Manhleke Matsanjeni Machibini Lomabhidla Lukhetseni Sigwenyama Sitsatsaweni (Rehabilitation)
		Nkalashane	Mafucula Ngozini
		Gilgal	Sigcaweni Phonjwane
Ngudzeni	Phobani Nyatsini Nokwane Ndushulweni	Bulunga	Ndlandlameni Hlutse Lesibovu Thembeni Mtfongwaneni Vulamehlo Ngculwini (Rehabilitation)
Mpolonjeni	Mbongolweni Lubilweni Mncitsini kaNdzangu Shoba	Shiselweni	Nkwene Buseleni Yishineni Kaphunga KaGwebu (Rehabilitation) Nkwene (Rehabilitation)
Matsanjeni	Matsanjeni Qomintaba Dinabanye Ekuphileni Nkonka Kwaluseni Bambitje Nsalitje	Sithobela	Hlutse Nxeka Mkhaya Mkhweli

III. PROJECT RATIONALE

III.1. Socio–economic surveys have revealed that water security and food security are the main priorities of SNL farmers. Other priorities include improvement of nutrition, reduction in livestock deaths, reduction of water borne diseases, an improvement of their environment and increased employment opportunities.

A. Community Priorities in the Project Area

III.2. ***Water.*** Findings from Swazi *Vulnerability Assessment Committee* (VAC) surveys in the project area have highlighted that the demand for access to water is the number one priority for communities in the project area. In a situation where most of the communities have no access to domestic water and irrigation water for agricultural production and where most of the rivers dry up and there are no dams, almost all the communities identified the need to look into water development issues. Communities were keen to access water predominantly for household consumption and irrigation of vegetables and cash crops. Many communities report that they have consulted with rural water supply authorities and studies have been carried out. The communities state they have started to collect community funds to contribute towards water projects and some have started supporting the necessary infrastructure. Domestic water supplies are inadequate. Water for irrigation would improve livelihoods and nutrition through expanded vegetable production that would be consumed and traded.

III.3. ***Health.*** Access to good quality health facilities was also a priority for communities. Communities cited HIV/AIDS as the main cause of illness and death in their communities and commented on the resulting high numbers of orphans and vulnerable children. Communities cite that orphans are now becoming a burden with social community systems seemingly unable to cope given the need to feed, clothe and educate the children. Distances to clinics are reported to be too far to travel, especially when ill. In some instances rivers have to be crossed to reach health facilities, making access difficult in the rainy season.

III.4. ***Education.*** While there have been a number of responses to assist the community in dealing with HIV/AIDS and its effects there is an urgent appeal to enable the communities to keep these children in school including subsidised or free primary education for orphans and/or primary school feeding schemes.

III.5. ***Food Security.*** It is possible to be food secure at both the household and national levels without being self–sufficient in food. For this reason, the GOS now seeks to address poverty and food insecurity by increasing the capacity of households to acquire food and other necessities rather than by aiming at self–sufficiency. The main cause of the widespread poverty found in Swaziland's rural areas is the large amount of labour that is devoted to low productivity, rainfed agriculture growing basic food crops (maize and vegetables) and the grazing of cattle and goats on SNL. Improvement in the efficiency and diversification of SNL agriculture will obviously be of benefit to rural households. However, it is essential to recognize that even a major improvement will still leave most SNL households with very low incomes and food supply. Development of improved agricultural farming systems that keep pace with food demands will have a critical input in the social and economic welfare targets set in the long term *National Development Strategy* (NDS).

III.6. MACO has noted that in an effort to make the food security programme more effective in a changing environment, the following strategic objectives for achieving improved food security should be taken into consideration:

- Promoting increases in agricultural production and productivity and enhancing food security at the household and national levels.
- Facilitating improvements in the welfare of the country's populations, especially those in rural areas, by promoting employment and income generation derived from the efficient and sustainable use of agricultural and natural resources.

B. Water Resource Utilisation

III.7. Over the past decade, Swaziland has experienced severe droughts that have left people with limited food and a stressed and degrading environment. Droughts and a decline in rainfed agriculture productivity has necessitated the intervention of international donors to provide food assistance.

III.8. The droughts and periods of low rainfall have also affected the flow of many rivers historically used for irrigation, livestock and domestic water. Declining surface water flows, particularly during the drier winter period, combined with increased levels of abstractions is necessitating the demand for more water storage facilities in the drier parts of the country to capture and store surface runoff during the summer rains. The dams are planned to capture summer rains and runoff and store the water for future use.

III.9. Historically, small dams constructed in rural areas have shown great benefits to the communities they serve provided that they are designed to suit the specific local conditions of the catchment, secure the active participation of the communities and provide basic and appropriate training to the communities on a range of issues including dam maintenance, catchment management, irrigation and public health.

III.10. Over the past 60 years the GOS has constructed a large number of dams throughout the drier parts of the country. These included several large dams for commercial irrigation and numerous smaller dams targeted at community use. The smaller dams have been widely recognised a valuable water sources for domestic and economic purposes particularly during the dry season but equally important for year round access to water. However many of these dams have fallen into disrepair due to a variety of reasons including a lack of community involvement in their planning and poor conservation of the dam catchment areas that has lead to siltation and in some cases breaching. Natural climatic events like the cyclone of 2000, caused breaching and spillway failures on many small dams.

III.11. A European Union supported programme for dam construction and rehabilitation was implemented between 1983 and 2000 where 35 dams were either constructed of rehabilitated. Under the EU supported *Earth Dams Construction Project* (Phase II), specialist training in catchment planning and water management was provided for two MOAC officers from the Land Use Planning Section of MOAC. These officers, who continue to work for the Section, have both academic and practical skills and knowledge in the preparation of dam system management plans including catchment management and soil conservation skills.

III.12. Under the same project, communities who had requested dams and were subsequently rewarded with dams and infrastructure, were given training in dam maintenance and management by MOAC. Training materials were developed and are currently still available.

III.13. During the 2003/2004–plan period the MOAC Land Development Section received local funding to purchase heavy machinery for land clearing and dam construction. The goal was to empower the section for them to construct earth dams themselves and not rely on external contractors.

The machines were also to be used in other activities that the section deemed appropriate in carrying out its mandate. To date machinery that has been purchased includes scrapers, rollers, a backhoe and an excavator. Already with the use of this machinery an earth dam has been rehabilitated at Malindza while another has been constructed at Mafutseni. During this plan period eight dams will be constructed at Lubulini, where construction of three earth dams has commenced. Other areas where earth dams will be constructed include Sigwe in the Shiselweni wherein eight are envisaged and at Nkilongo in the Lubombo region wherein six dams will be constructed.

IV. PROJECT OBJECTIVES

IV.1. The ***overall objective*** of the project is to reduce poverty and increase the socio–economic status of rural households through the construction or rehabilitation of small earth dams and related downstream infrastructure that includes irrigation, livestock watering, domestic water supplies and improved catchment management.

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

- to construct or rehabilitate up to 20 dams (250,000 m^3 water stored) in the Lower Middleveld and Lowveld areas of Swaziland;
- to provide water for irrigation, livestock and domestic purposes;
- to increase the employment and household income opportunities of project beneficiaries in the rural areas;
- to prepare integrated catchment development plans and conservation strategies for each dam system to improve natural resources management by increasing farmers' awareness of the problem and knowledge of soil and water conservation techniques;
- to provide technical assistance in participatory water management;
- to provide training for GOS officers to ensure continuity in rural water management and planning;
- to increase food production by improving the technical agronomic skills of beneficiaries and strengthen the capacity of the grassroots beneficiaries, NGOs, CBOs in sustainable farming and vegetable crop production.

V. PROJECT DESCRIPTION

V.1. The project has been designed to last 4 years during which time suitable dam sites and communities will be identified, evaluated and short listed (first and second year of project) and project funds will be used to improve existing small earth dams or construct new dams with their associated downstream developments (third and fourth year of project). Integrated catchment development plans, conservation strategies and environmental impact assessments will be prepared for each short listed site where social and physical conditions are evaluated to be conducive for dam construction and development.

V.2. Further evaluation of each short listed site would identify dams that provide the best opportunities for alleviating poverty through the provision of water and irrigation infrastructure.

V.3. The following key activities are envisaged:

V.4. ***Recruitment of Technical Assistance for participatory land and water management planning.*** The TA would be the overall Project Manager and be responsible for the administration and technical competence of the project. The TA will be recruited by the project and be housed at the MOAC Land Use Planning office

V.5. ***Recruitment of a socio–economist for dam site selection studies.*** A local socio–economist would be recruited via an open tender process to provide technical assessments of the beneficiary social and technical capacity of selected communities to participate in a dam project. The socio–economist would be required to undertake relevant surveys to quantify the present and future socio–economic status of the beneficiary and provide feedback into the monitoring and evaluation process.

V.6. The socio–economist would also be responsible for the design of an institutional organisational structure to ensure coordination between the stakeholders and to bridge the gaps between the communities, rural extension officers, the project (including dam contractors) and participating NGOs (technical steering committee at national level and smaller regional committees). Several socio–economists are available in Swaziland to perform this activity

V.7. ***Prepare dam site evaluation criteria/methodologies.*** For all dam sites submitted by communities, a thorough review of the merits and weaknesses of each site is needed to ensure project funds are used effectively. Evaluation of potential dams sites and communities must be carried out in a comprehensive and structured manner that builds on the experience gained by the EU project and subsequent NGO dam projects. The Project Manager in consultation with relevant specialists will undertake these site evaluations. Average cost is estimated at US$2,200/dam.

V.8. ***Design or review existing training programme from earlier EU project.*** Training of beneficiaries in a range of skills is required to ensure the sustainability of each dam site. Skills in dam maintenance, catchment management, conflict resolution, financial management, irrigation management, irrigated crop management and public health issues are the range of skills required. A training programme to train these communities will be developed and implemented by local organisations through an open tender process. Average cost: US$6,000.

V.9. ***Identify and select dam sites.*** The identification of suitable dam sites is initiated by the communities themselves. Following an awareness campaign about the project and its overall objectives, communities will be asked to contact their local Agriculture Extension Officer who will make a preliminary inspection of the community proposed dam site. Based on his professional experience, the EO will pass the request to the Project Manager for a more detailed site evaluation. Using a methodology described previously, the most suitable sites will be evaluated and selected. Average cost: US$2,000/dam.

V.10. ***Conduct socio–economic studies in selected dam areas.*** In areas where catchment characteristics and community commitment is assured, a detailed socio–economic assessment will investigate the level of commitment of the community and identify weaknesses in the community structures. Committed community organisations are critical for the success of the project, however many communities are disorganised but do have the potential to come together for the common good. Average cost: US$5,000/dam.

V.11. ***Conduct environmental impact studies in the selected dam sites.*** Existing environmental legislation requires a change in land use to be subjected to an environmental impact assessment (EIA). The EIA is often carried out by local environmental consultants and investigate a range or social and

bio–physical impacts that are likely to result from the implementation of the project. Based on the findings of the EIA a mitigation plan, to address the identified impacts, is prepared and submitted for review and approval by the *Swaziland Environment Authority* — the national environmental regulator. Average cost: US$5,000/dam.

V.12. ***Design dams and catchment area protection measures.*** The design of dams will be carried out by professional consulting dam engineers. The design (or verification) of catchment protection measures will be carried out by local conservation engineers or MOAC engineers. Through an open tender process, dam engineers will be recruited to provide engineering services. Average cost: US$5,000/dam.

V.13. ***Identify downstream development possibilities.*** The overall objective of the project is to provide water for irrigation. Apart from irrigation, other downstream opportunities may exist to further enhance the utility value of the stored water. Water for domestic and livestock demands are the most requested projects by communities. Drought and low rainfall often leaves rural communities in the project area water stressed with the resulting decline in food security.

V.14. Many previously constructed dams in the country have successfully utilised the stored water for livestock, primarily, and domestic water supplies. The use of stored water for domestic consumption requires that some basic treatment of such water is carried out prior to human use. Many simple and appropriate technologies exist to cheaply and effectively clean water to standards recognised by the World Health Organisation. Such technologies will be evaluated by the project for application in the project supported dams. Average cost: US$1,500/dam.

V.15. ***Recruitment of local dam engineers for design and supervision of dam construction and rehabilitation.*** Local dam engineers would be invited to tender for engineering designs for each dam constructed or rehabilitated. Tenders would be evaluated by the Project Manager and Steering Committee with inputs from independent engineers on technical issues.

V.16. ***Implement training programme for dam committees on dam management and maintenance.*** From previous experiences in dam construction and rehabilitation, training communities in dam management and maintenance is critical for the long term sustainability of the dam and its downstream activities

V.17. During the implementation of the EU *Earth Dams Rehabilitation and Construction Project* between 1996 and 1998, training programmes were developed and field tested and eventually adopted in all dams supported by the EU project. Such training manuals are still widely used with local adaptation.

V.18. During the course of this project, these training materials will be re–evaluated and amended where necessary to improve upon their effectiveness. With a revised manual, training programmes, carried out be local training experts and MOAC Extension Officers, will be given to all communities selected to receive a project supported dam. Average cost: US$2,000/dam.

V.19. ***Tender and construct dam and catchment protection measures.*** Dam designs, prepared by local consulting dam engineers, will be put out to tender by contractors to construct or rehabilitate the identified dams. Catchment management plans, a critical feature for all dams, will be developed by the Project Manager or organisations recruited to perform theses services in consultation with the affected communities taking cognizance of local strengths and weaknesses.

V.20. Experience from previous dam has shown the imperative nature of a well designed and community supported catchment management plan in order to ensure the longevity of the dam. The format for catchment management plans has previously been developed, and the project will review the criteria and information used, to ensure that project developed plans are relevant, technically and financially acceptable and practical.

V.21. Integrated development plans have been shown to be beneficial to achieving improved socio–economic performance of participating communities. These plans will be developed by the Project Manager or organisations recruited to perform theses services in consultation with the affected communities taking cognizance of local opportunities and constraints. Average cost: E25/m^3 water stored.

VI. INDICATIVE COSTS

VI.1. The project will provide support for:

- Project coordination costs, including coordination meetings, promoting expanded multi–partner involvement.
- Field services, including the training, personnel equipment, and costs associated with the design and implementation of the interventions.
- Financial management of the project, in particular with respect to financial management of the donor funds. It includes operational and financial planning, monitoring of the physical and financial execution of the project, procurement, accounting, internal audits, and personnel management.

VI.2. The following tables attempt to broadly cost the activities required for the successful implementation of the project. The budgets are indicative and relate broadly to a 40,000 m^3 dam.

VI.3. The activities and budgeting are subject to further detailing during project design and implementation after ground–truthing studies and community and stakeholder consultation exercises have been carried.

Table 2: Summary Cost per Component (US$)					
Activity	Local	Foreign	Total (US$)	% Foreign Exchange	% Total Base Costs
1. Technical Assistance (Project Manager)	60,000	340,000	400,000	6.5%	7.63%
2. Local engineers for design and supervision of dam construction and rehabilitation	9,750	55,250	65,000	1.1%	1.24%
3. Socio–economist and EIA for dam site selection studies	22,500	127,500	150,000	2.4%	2.86%
4. Review of existing dams and catchment management training programme	900	5,100	6,000	0.1%	0.11%
5. Preparation of dam site evaluation criteria/methodologies	12,000	68,000	80,000	1.3%	1.53%
6. Identification and selection of dam sites	7,500	42,500	50,000	0.8%	0.95%
7. Design of dams and catchment area protection measures	6,000	34,000	40,000	0.6%	0.76%
8. Identification and design of downstream development possibilities	105,000	595,000	700,000	11.4%	13.36%
9. Implementation of training programme for dam committees on dam management and maintenance	9,000	51,000	60,000	1.0%	1.14%
10. Tender process and construction of dam and catchment protection measures	540,000	3060,000	3,600,000	58.4%	68.69%
11. Project Administration	6,000	34,000	40,000	0.6%	0.76%
12. Capacity building and institutional support	7,500	42,500	50,000	0.8%	0.95%
Total Project Costs	786,150	4,454,850	5,241,000		

Table 3: Cost (US$) Summary per Component per Year					
Component	Year 1	Year 2	Year 3	Year 4	Total
1. Technical Assistance (Project Manager)	100,000	100,000	100,000	100,000	400,000
2. Local engineers for design and supervision of dam construction and rehabilitation	6,500	19,500	19,500	19,500	65,000
3. Socio–economist and EIA for dam site selection studies	75,000	45,000	15,000	15,000	150,000
4. Review of existing dams and catchment management training programme	6,000	0	0	0	6,000
5. Preparation of dam site evaluation criteria/methodologies	48,000	32,000	0	0	80,000
6. Identification and selection of dam sites	40,000	10,000	0	0	50,000
7. Design of dams and catchment area protection measures	20,000	12,000	4,000	4,000	40,000
8. Identification and design of downstream development possibilities	350,000	140,000	140,000	140,000	700,000
9. Implementation of training programme for dam committees on dam management and maintenance	30,000	12,000	12,000	12,000	60,000
10. Tender process and construction of dam and catchment protection measures	360,000	1,080,000	1,080,000	1,080,000	3,600,000
11. Project Administration	16,000	8,000	8,000	8,000	40,000
12. Capacity building and institutional support	20,000	10,000	10,000	10,000	50,000
Total Project Costs	1,071,500	1,468,500	1,388,500	1,388,500	5,241,000

VII. PROPOSED SOURCES OF FUNDING

VII.1. At present no other donor is providing support for improving rural livelihoods through the construction and rehabilitation of earth dams. The GOS have initiated a dam construction project for the financial year 2004–2005 where 10 new dams will be constructed. Preliminary work has begun on identifying priority sites that offer the greatest advantage for development.

VII.2. It is anticipated that the cooperating partner that takes up this project, will bring with it the technical knowledge and experience in relevant areas such as dam design, project management, community mobilisation, training and support for planned and sustainable rural development by optimising the use and management of locally available skills and resources and ultimately establishing conditions that would stimulate and attract private sector investment in the tourism sector that many of the project areas can offer.

VII.3. This project is considered to be a high profile bankable project that has broad Government support, thus the GOS is going to be an important source of funding with additional contributions from cooperating partners which at this stage are not defined. GOS are committed to providing 10 percent of the project costs which will mostly be in kind, but may also be material. Beneficiaries will be expected to contribute 5 percent of project costs with the bulk of this offered in kind (mostly through the provision of labour).

VII.4. Appropriate support staff from key GOS institutions will be seconded to the project to facilitate community participation, planning and project execution. GOS will further contribute office and housing accommodation for project staff.

VII.5. The GOS will present this project profile to donors within the overall NEPAD–CAADP framework for financial support and contributions.

VIII. PROJECT BENEFITS

VIII.1. Project benefits are designed to be realised by the communities which participate in the implementation of project interventions.

VIII.2. At this stage in project formulation, the number of beneficiaries has not been calculated, but it is expected to be in the region of 30,000. Preparatory studies have been conducted that identified the priority areas for dams (Table 1). Community expectations and participation, based on a random survey of several areas, showed that the population likely to benefit are very motivated. The nature of their participation has not been determined, but based on other project experiences it is likely that women are going to be the most motivated and involved.

VIII.3. During evaluations carried out on previous dams projects, the communities are eager to participate in water supply projects.

VIII.4. Specific benefits will include the following:

- Reliable source of water especially during winter;
- Sense of water security;
- Development of agriculture and agribusiness;
- Improved human resource development.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. The Executing Agency for the project is the *Land Use Planning Section* (LUPS) of the Ministry of Agriculture and Cooperatives.

IX.2. The LUPS will provide on a part–time basis one dam design engineer, one irrigation engineer, one land planning officer and one soil surveyor.

IX.3. The LUPS will be supported with periodic assistance from:

- The *Senior Extension Officer* from affected rural development areas;
- The *Regional Development Officer* (RDO) to provide technical assistance to the traditional structure (Chiefs);
- *Agriculture Field Officers* that act as the link between the project and the communities;
- *MOAC Forestry Section* to provide technical assistance with community forestry and forest resource management;
- *MOAC Fisheries Section* to provide technical assistance to communities wishing to include fisheries as a product of the dam;
- *MOAC Land Development Section* to provide technical and practical assistance to dam committees on provision of infrastructure (mainly roads and soil conservation materials);
- *MOAC Home Economics Section* to provide technical assistance and training to dam committees on food security and nutrition issues;
- *MOAC Small Irrigation Unit* to provide technical assistance for micro–irrigation designs utilising water from the dam;
- *MOAC Extension Service*, specifically *Extension Officers*, to provide technical assistance and training to dam committees on arable and livestock issues.

IX.4. ***Monitoring and Evaluation.*** A project steering or management committee will monitor and evaluate project interventions through the:

- development and continuous improvement of an innovative and adequate scientific long term monitoring and evaluation system with "*sustainable process indicators"* for assessing changes in ecosystem management patterns on a local and national level for land degradation, biodiversity and land use (benchmark sites, sampling procedures, etc). Local capacity and know–how will be build up and used to enable communities to participate in the development and implementation of monitoring and evaluation;
- systematic review of experiences gained by cooperating with ongoing research programs to verify the operational feasibility and viability of promoted ecosystem concept.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. The project would require both long term and short term TA inputs. The ***long term TA*** would be in the fields of: (a) project management; (b) land and water management; (c) irrigation engineering and design; and (d) horticulture and marketing. ***Short term TA*** inputs would include: (a) a specialist in vegetable production, marketing and storage (including disease and pest management); (b) training specialists (dam management and maintenance, soil conservation, community organisational systems); and (c) an environmental manager to coordinate the environmental impact assessments (d) a socio–economist to undertake community impact surveys.

X.2. To add support to the implementing institution, MOAC, professional development of key MOAC Officers will be required. Immediate training needs have been identified in land and water management and public health/nutrition/rural development/community participation.

X.3. Short courses are to be developed and given to key implementing institutions in water management, dam maintenance and project management.

XI. ISSUES AND PROPOSED ACTIONS

XI.1. There are several areas which would need to be examined in detail as part of further processing of this project:

XI.2. ***Sustainability of dam systems.*** The sustainability of the dam systems needs to be ensured through a review of all previous dam projects implemented in Swaziland. Evaluation reports and consultations with implementing agencies will be critical in assessing the key obstacles to the successful implementation of a dam system within a community.

XI.3. ***Protection of dam catchments.*** Previous evaluations of dam–type projects have identified the critical importance of a managed catchment to ensure the longevity of the dam. Erosion and mismanagement of dam catchments have led to the siltation of several dams in the country which has markedly reduced the performance of the dam. It is critically important that detailed inventories of each catchment is carried out to evaluate the potential for degradation.[3]

XI.4. ***Participation.*** Participation is clearly crucial to successful implementation. The means of ensuring the full and willing participation of local communities in the planning, implementation and monitoring of the project must be elaborated. There are examples of successful consultative planning at the service cooperative level which could be used as models. Wherever possible, local NGOs with experience in this field should be contracted to assist in the execution of certain project activities. Provision must also be made for field staff to be trained in this approach to working with farmers and for flexibility in the way conservation programmes are designed and implemented at the community level, so as to reflect the interests and capacities (especially in terms of labour) of the communities concerned.

XI.5. ***Dam maintenance.*** Financing continuous dam maintenance is often a burden for many communities. To ensure the sustainability of the dams, communities must be made aware of the importance of establishing a maintenance fund and methods to be used in operating such a fund.

[3] Cf. *Handbook for the Assessment of Catchment Water Demand and Use* (DFID, May 2003).

XI.6. ***Production.*** Although many rural Swazi communities produce vegetables for household use, a weakness exists in the capacity of these communities to expand their garden type production to a more formalised irrigated production system. Training of beneficiaries in a range of production issues and methods should overcome the identified weakness.

XI.7. ***Financial.*** Sustainable financial management of community funds is often a source of disagreement and confusion for rural communities. Training in a range of financial management practices must be given to all dam beneficiaries.

XI.8. ***Marketing.*** Marketing of arable produce produced by small–scale farmers is a common problem. The capacity and knowledge of marketing methodologies by rural communities is sporadic and in some areas would require training in modern marketing techniques and methods. Transport costs to markets can often make produce too expensive for buyers so greater effort is needed to either reduce the cost or market produce locally.

XII. POSSIBLE RISKS

XII.1. There are some risks that may occur during project preparation and implementation and these are foreseen in the following areas:

XII.2. ***Implementation delays.*** Funds disbursement, if tied to Government systems, may cause delays in disbursement. However, such delays are usually attributed to bureaucratic delays. Methods to streamline disbursement delays would have to be sought by the Project. The use of NGOs to manage and disperse the funds has previously proven to the most efficient and effective method

XII.3. ***Community participation.*** Preliminary surveys of potential beneficiaries indicate a fairly widespread support for the range of activities envisaged in this project, however, the project must be seen as yet another rural development project that calls for community participation and at times financial contributions. With many rural development projects taking place in many of the potential beneficiary communities, the availability of time to attend meetings and undertake specific actions might cause implementation delays. However, with close coordination among the organisations undertaking rural development work in the project areas, the burdening of communities could be better optimised and timed.

XII.4. ***Land rights.*** Although every Swazi has, as a birth right, the right to land, the proposed changes in land use and management might cause conflict with affected land users. With fertile land becoming scarce and rising rural populations, some land users might resist attempts to force change and settle for the status quo.

XII.5. Chiefs, the local custodians of land and its allocation, have in the past hampered the implementation of development projects which they feel do not adequately meet their and their subjects expectations. Without the Chiefs authority to change or improve land use, the projects earmarked for such areas would be severely constrained. It is therefore essential to get the support and commitment from all affected Chiefs early in project design and implementation when adjustments to the scale of intervention or type of intervention can be changed to suit the demands or needs of these Chiefs.

XII.6. Where project areas identified cover one of more Chiefdoms, sensitive discussions would need to held to garner support form all Chiefs involved. Chiefdom boundary disputes have in the past affected the efficiency of delivering development. Although such disputes are rare, when they occur the project should remove such areas from receiving project benefits to avoid implementation delays.

Appendix: Map of Swaziland Showing Project Area

The project area comprises the Upper and Lower Middleveld and Lowveld AEZ regions of the country. Within these regions 50 potential sites for new dams have been identified (Table 1).