New Partnership for
Africa's Development (NEPAD)

Comprehensive Africa Agriculture
Development Programme (CAADP)

Food and Agriculture Organization
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Investment Centre Division

GOVERNMENT OF THE UNITED REPUBLIC OF TANZANIA

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume VI of VII

BANKABLE INVESTMENT PROFILE

Land Management and Development of Irrigation Schemes (Zanzibar)

April 2005

UNITED REPUBLIC OF TANZANIA:

Support to NEPAD–CAADP Implementation

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

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NEPAD–CAADP BANKABLE INVESTMENT PROFILE

Country: Tanzania – Zanzibar

Sector of Activities: Irrigation and Water Control

Proposed Name: **Land Management and Development of Irrigation Schemes**

Duration of Project: 5 years

Estimated Cost: Foreign Exchange ..... US$10.3 million
Local Cost ..... US$1.3 million
Total ..... US$11.6 million

Suggested Financing:

Source	***US$ million***	***% of total***
Government	0.70	6
Financing institution(s)	10.30	89
Beneficiaries	0.60	5
Total	***11.60***	***100***

UNITED REPUBLIC OF TANZANIA:

NEPAD–CAADP Bankable Investment Profile

"Land Management and Development of Irrigation Schemes" (Zanzibar)

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Abbreviations

BIP	Bankable Investment Profile
CAADP	Comprehensive Africa Agriculture Development Plan
DADO	District Agricultural Development Officer
FA	Farmer Association
FEG	Farmer Extension Group
FFS	Farmer Field School
FRG	Farmer Research Group
GDP	Gross Domestic Product
IA	Irrigators Association
MANREC	Ministry of Agriculture, Natural Resources, Environment and Co–operatives
MFIs	Micro–finance Institutions
NGO	Non Governmental Organisation
NMTIP	National Medium–Term Investment Programme
PADEP	Participatory Agricultural Development and Empowerment Project
PFU	Project Facilitation Unit
RADO	Regional Agricultural Development Officer
RASS	Rapid Agricultural Sample Survey
SACA	Saving and Credit Association
SACCO	Savings and Credit Co–operative Organisation
VDA	Village Development Association
WUAs	Water Users Associations
ZIMP	Zanzibar Irrigation Master Plan
ZPRP	Zanzibar Poverty Reduction Plan

I. PROJECT BACKGROUND

A. Project Origin

I.1. This *Bankable Investment Profile* (BIP) was prepared by the *Ministry of Agriculture, Natural Resources, Environment and Co–operatives* (MANREC) in accordance with the *Zanzibar Irrigation Master Plan* (ZIMP) and the "*Feasibility Study for the Development of the Agricultural Sector in Zanzibar"*. Together, the two documents identify a comprehensive irrigation strategy for Zanzibar: the ZIMP develops a strategic plan to alleviate irrigation and water use constraints in order to foster and sustain the development of irrigation farming, while the Feasibility Study presents an irrigation sector analysis that emphasizes a development program for appropriate and efficient agricultural water use on specific sites. Short term objectives proposed in the ZIMP include: (i) new irrigation development based on alternatives to government ownership; (ii) greater involvement of the private sector; (iii) establishment of appropriate, cost effective technologies; and (iv) addressing environmental issues related to irrigation development.

I.2. As part of the reorganization of MANREC responsibilities, the Zanzibar Government has also recently established a *Department of Irrigation* in order sustain the development of irrigation infrastructure and to foster irrigation development in the isles. The investments in this BIP are designed to complement this policy and institutional framework and bring renewed focus to more effective conservation of water resources and expansion of the area under irrigation.

B. General Information

I.3. Agriculture is the dominant economic activity in Zanzibar, accounting for an average of 34 percent of the Gross Domestic Product (GDP) in 2002 and providing about 75 percent of the foreign exchange earnings. Roughly 80 percent of the total population derives their livelihood directly or indirectly from the sector. Real GDP growth rate of the agriculture sector was negative in 2000 (0.7 percent), declining from a positive 7 percent in 1999. The decline is mainly attributed to adverse weather conditions and price factors which affected production of cash crops, especially cloves, whose production declined by 77 percent. Seaweed production, the second major export crop; also decreased by 24.5 percent. In Zanzibar, wide varieties of spices are grown and clove represents the most important export crop, contributing over 50 percent of foreign exchange earnings. Fruits such as mango, papaya, bananas, citrus, as well as coconut are essential crops in the islands' cropping pattern. Food crops cover 60 percent of the total cultivated land. Common food crops grown include cassava, rice, sweet potatoes, potatoes, sorghum, maize, legumes and tomatoes. Except for rice and often maize, the bulk of these crops are grown under rainfed conditions.

I.4. Zanzibar agriculture is characterized by smallholder farming with the overwhelming majority of the farmers living at the subsistence or semi–subsistence level with a small amount of marketed crop production. Agricultural activities in the isles are highly labour intensive with most farmers depending on hand hoe and other traditional hand implements for crop production. In the absence of inputs subsidies, smallholders are generally unable to afford farm inputs resulting in relatively low agricultural productivity. Lack of improved, low cost traditional technologies or high value agricultural products also limit the growth of farmers' incomes. In addition, most agricultural production is not commercially oriented and support for services such as input supply, agro–processing and marketing are poorly developed hence leading to poor cost recovery and low incomes.

I.5. In sum, heavy dependence on the rainfed agricultural system; low investment in the agricultural sectors; inadequate access to financial services for agricultural producers and support

services such as research, extension, plan protection, and input supply and distribution are among many identified problems facing agricultural performance.

I.6. ***Irrigation potential.*** The amount arable land in Zanzibar is estimated at 130,000 ha of which 8,521 ha have been identified as having potential for irrigation. Currently, Zanzibar has only 400 ha under irrigation. Preliminary studies indicate that Pemba Island has a reservoir capacity sufficient for 37 small dams estimated at 6.81 million cubic meters while Unguja Island has the capacity of 2.29 million m^3 for three small dams in addition to abundant ground water resources. With the existing trends in production, which depend heavily on rain fed agriculture, production of rice is projected to reach 13,000 tons in 2020. However, with the development of 8,521 ha for irrigation and continued rain–fed farming, production could be raised to more than 40,000 ton/year. Thus irrigation development has the potential to improve household food security significantly and reduce reliance on imported food. Although rice production has high potential under irrigated systems, production of vegetables and other high value crops could also provide good returns; cropping choices in future irrigation sites would depend on agronomic conditions and evaluation of profit potential.

I.7. Irrigation potential is also high in the other most commonly used irrigation method in Zanzibar — dry land irrigated through rainfall collection. Although there is little use of ground water pumping and weir/dam diversion structures with canalization, a variety of tropical crops are grown under rainfed agriculture at subsistence and cash crop levels. Both high potential and marginal lands are cultivated under rainfed conditions, at relatively low levels of productivity. Dependence on rainfed agriculture makes production vulnerable to adverse rainfall patterns such as terminal drought or intermittent dry spells during the rainy season. In the absence of effective conservation measures, drought and surface runoff also result in deterioration of production resource base.

I.8. A key element to improvement in water management and conservation is rainwater harvesting for dry land water management. The practice of rainwater harvesting offers farmers both production and conservation benefits and, with little improvement, incremental gains could be significant by virtue of the large amount of land under the rainfed sector. Traditional rainwater harvesting is most common in irrigated rice cultivation using earth basin structures in the weir/dam diversion systems. In contrast, rainwater harvesting in dry land rice farming is based on the construction of earth bunds to permit rainwater or gravity fed irrigation water to be collected and impounded in the field during the rainy season. This traditional system, while meeting the needs of farmers, does not comply with the general principles of efficient rainwater harvesting design and implementation. The irrigation development plan and agricultural water use analysis conducted in Phase I of the "*Feasibility Study for the Development of the Agricultural Sector in Zanzibar"* recommends modification of these traditional practices into more appropriate and suitable water harvesting system for better dry land water management. The package comprises a small–scale system built entirely on indigenous knowledge and predominately used for crop production.

II. PROJECT AREA

II.1. The proposed investment targets four irrigation sites, namely Mlemele and Makwararani Irrigation Schemes in Pemba Island, and the Bumbwisudi and Chaani Irrigation Schemes in Unguja Island. It also includes rainwater harvesting and land management aspects within six cluster sites — namely Cheju, Muyuni, Mtende, Kibokwa, Kilombero and Bambi in Unguja Island.

II.2. ***Topography, Climate and Soils.*** The topographic feature of Zanzibar is generally characterized by three distinct landscapes: (i) undulating and elevated surfaces, (ii) flat valleys basin,

and (iii) flat coastal periphery or coral rag areas. The topography of the project sites is directly related to these landforms. In Kilombero, Kibokwa, Bambi and Cheju areas the undulating and elevated surfaces dominate, forming a series of corridor (valleys) and extensive flat lands which are used as paddy fields. The flat to gentle undulating land surfaces are well suited to the proposed rainwater harvesting technique. Muyuni and Mtende sites lay just on fringe edge of the flat coral rag platform on the eastern coast and southern parts of Unguja Island, whereas the Chaani, Kibokwa, Upenja and Kilombero plains are located on the Bambi/Upenja corridor.

II.3. The proposed project area occupies the most fertile, relatively flat lowland clay and clay/sandy loam plains away from valley bottoms, which are dominated by basin flooding for rice cultivation. These areas have deep, well to moderately well drained reddish soils on the upper slopes, deep well to moderately well drained brownish soils in the mid to lower slopes and low lying deep but sluggishly draining yellowish soils. Nitrogen and phosphorous are mostly limited on these soil types while potassium is usually available at moderate levels. Zinc deficiency is reported in some valleys used for rice production especially where Vertisols are dominant. From an agricultural land quality perspective, the Kilombero, Cheju and Kibokwa have good lowland deep soils and fall within farming system zones designated as 2, 3 and 5 for cultivating cash crop/livestock, food crops/livestock and food crops/trees. The Muyuni and Mtende sites are located within marginal lands with shallow soils (coral rag).

II.4. The climate of Zanzibar is dominated by bimodal rainfall patterns which give rise to four distinct seasons. Two wet seasons locally known as Masika and Vuli are usually reliable and provide greater opportunity for cultivation. Total annual rainfall in the project areas is relatively abundant ranging from 1,900–1,300 mm with maximum amount in April/May.

II.5. ***Agriculture, Land Capability and Crop Suitability.*** The cropping and land use pattern in Kibokwa and Kilombero areas are in the same farming system (zone 2) and currently all crops are raised under rainfed conditions. Yields are relatively lower compared to the yield from the irrigated fields. Most of the paddy and cowpea produced is consumed by the family with income from upland crops generally non existent. As a result, farmers supplement their farming activities with other income generating businesses or employment.

II.6. Muyuni and Mtende areas are in zone 4, where maize is the crop with the highest comparative advantage. Other major crops grown in zone four are cowpeas, pigeon peas, millet/sorghum, mangoes and chilies. Farmers in Muyuni and Mtende area also cultivate paddy during the heavy rainy season and beans during the dry season in lowland rainfed areas. Upland crops grown are cassava, maize, pumpkin, vegetables (tomatoes and eggplant) and muck beans. Farming activities are generally considered to be subsistence, with all crops intended mainly for household consumption. Food scarcity reaches its peak in April/May. Off–farm activities such as fishing and seaweed farming are important supplement to household food and cash income. The bush fallow farming system is practiced in large areas covered by coral land. Although the fallow system was once sustainable, it is now often constrained by decreasing fallow periods and declining soil fertility. Main farming activities are conducted during the Masika season as the Vuli rains are unreliable, thus increasing risk of crop failure. Because of rainfall unreliability, both in terms of distribution and quantity during either of the two cropping seasons, rainwater harvesting is proposed as an alternative solution to improve the dry land water supply and conservation.

II.7. The Cheju and Bambi area fall into the farming zone number 5, which is dominated by the shallow soil "Kinongo", which has been used for coconut production and citrus in recent years. Areas of deep soil Kinongo are used for open areas for grazing as well as for rainfed annual food crops cultivation. A wide variety of food crops are grown on these areas such as cassava, rice, sweet potato,

millet, sorghum, banana, maize and cowpea. Main cash crops of this zone include coconuts, banana mango, papaya, vegetables and citrus.

II.8. ***Infrastructure.*** Although none of the project sites could be considered remote by local standards, basic infrastructure is limited in the rural areas. All weather roads run through or close to the project areas but feeder roads are, however, quite limited, being little more than tracks. Each location has nursery and primary schooling facilities, and a health centre at close proximity. Main human disease problems in the areas are malaria, diarrhoea, pneumonia and respiratory illnesses. Each proposed site has an access to a safe and adequate domestic water supply through installed overhead water tanks.

II.9. ***Social Setting.*** All proposed sites have organized farmers' associations that are registered as *Water Users Associations* (WUAs) or as co–operatives. These organizations would be the main actors for operation, maintenance and management of the schemes. However, it should be noted, these organizations are institutionally, financially and technically weak and may not have sufficient capacity to fulfil their obligations. There is no legal legislative and regulatory framework to facilitate formation of strong farmer groups/associations or to help them operate smoothly to ensure group cohesiveness and sustainability. Thus capacity building for farmers' associations should be a priority area for any intervention.

III. PROJECT RATIONALE

III.1. The Zanzibar Government is currently undertaking various reforms aimed at improving the economy and achieving the *Zanzibar Poverty Reduction Plan* (ZPRP) targets through higher agricultural productivity. Irrigation farming has good potential to increase the stability and productivity of agriculture and can be regarded as one element in an integrated approach to poverty alleviation in rural areas. Recently conducted studies and consultations with beneficiaries indicated intensification and diversification of food and cash crops; installation and improvement of agricultural infrastructure; and introduction of a holistic agricultural production were key issues to improving agricultural performance. Irrigation provides higher returns for land and labour through higher and more reliable yields, allowing higher value crop production, and thus contributing to improved incomes and food security. Rice, banana and sweet potato are considered important as food security crops and pulses and vegetables as second crop options targeted for the local market. High value crops such as fruits, vegetables and spices can also be further developed. Additionally, irrigation can assist in promoting local food sourcing (fresh fruits, herbs and spices, and vegetables) to meet the requirement of an expanding tourism industry.

III.2. Irrigation provides a means to intensify production, a necessity within the context of the isles where the opportunity for expansion of cultivation is limited and little other income generating activities takes place. In the subsistence agricultural economy of Zanzibar, where labour is abundant and cash is in short supply, a labour intensive production, low external input system of irrigation is an important component of rural development for the following reasons:

- Absorption of the active employed population into a production system of double cropping under irrigation, instead of single cropping as in most rain fed activities;
- Gradual integration of the subsistence farmers into the market economy;
- Agricultural production to keep pace with population growth and;

- Reduction of environmental degradation resulting from the pressure on the land resources from rain fed agriculture.

III.3. Given the limited financial capacity of the farmers to undertake irrigation investment on their own, significant investment is essential in the following key areas:

- Provision of appropriate technological packages related to small–scale, low–cost water harvesting technique for increasing production, improving land husbandry and conserving soil moisture;
- Capacity building in training of farmers and staff.

III.4. Water harvesting interventions would be introduced with the objectives of reducing soil moisture stress and loss effect on rainfed crop yield for increasing and stabilizing crop productivity, conserving production resource base and improving the livelihood condition of the local population. The basic design consideration would include installation of irrigation infrastructure, construction of contour bund water harvesting structure in the rainfed area for interception, collection and storing of surface runoff water in the soil profile, cultural practices improvement and capacity building of the technical staff and the beneficiaries.

III.5. ***Lessons learned in irrigation management.*** Greater focus is being placed on small–scale irrigation schemes as Government moves away from previous, more centralized methods of irrigation development and management. New modalities of irrigation scheme development are to be implemented so as to strengthen District Offices and accommodate privatization initiatives that are being implemented as part of the Government's development policy. These and other experiences in irrigation development globally highlight the following issues for programme design: (i) irrigation schemes should be implemented on a contract basis with involvement of the private sector; (ii) beneficiaries should participate in the entire scheme implementation process; (iii) strengthening of District Offices should be incorporated in the implementation process; and (iv) tendering and contract award should be done in a fair and transparent manner.

IV. PROJECT OBJECTIVES

IV.1. The ***overall goal*** of the programme is poverty reduction, improved food security and increased incomes among communities through irrigation development and water harvesting conservation.

IV.2. ***Specific objectives*** are:

- To initiate water harvesting development in select areas of the isles;
- To construct small dams and rehabilitate existing irrigation canal systems;
- To rehabilitate pump systems and construct ponds to harvest and store surface rainwater;
- To strengthen the capacity for IA management;
- To enhance farmers' skill for operation and maintenance of irrigation infrastructure;

- To develop irrigated crop production technologies adopted to smallholders and to identify and promote other irrigated crops;
- To build the capacity of the irrigation sub–sector enable to implement the project; and
- To continue subsequent developments once the project is terminated.

V. PROJECT DESCRIPTION

V.1. The underlying principle guiding project design is the need to ensure the effectiveness and long term sustainability of programme investments. As a result, the programme design would incorporate the following elements: (i) building technical capacity and scaling investments to match local capacity; (ii) ensuring financial sustainability of irrigation investments; and (iii) institutional/organizational strengthening.

Principle	Implication for Programme Design
Building Technical Capacity and Appropriate Scaling of Investments	• Planning and design of irrigation infrastructures taking into consideration farmers' capacity of O&M and water management. • Raising of technical knowledge of farmers on O&M and water management, providing appropriate training to them.
Financial Sustainability	• Formulation of a rehabilitation / improvement plan for irrigation infrastructure considering farmers affordability to O&M. • Preparation of an agricultural development plan, which leads to improvement of farmers' profitability, encouraging them to introduce vegetable farming.
Institutional/Organizational Strengthening	• Institutional strengthening for raising the capacity of organizational management of IA, such as leadership, decision making, and conflict resolution. • Institutional strengthening for raising financial management by IA, such as collection of water fees and O&M cost. • Promotion of farmers' participation in project implementation during planning, design, and construction periods.

V.2. The project would run for five years and would comprise of the following ***four components***:

<u>Component 1:</u> Water Resources Management and Infrastructure

Component 1.1: Rehabilitation/installation of irrigation infrastructure

V.3. This component would support adoption of various irrigation and water conservation techniques including farmland conservation through bunds construction; run–off management through construction of drainage channels, outlets and water improvement; construction of access roads; gulley control by construction of check dams and vegetative controls; and biological conservation techniques and soil improvement. Irrigation infrastructure would be confined to a relatively well defined area with water harvesting activities implemented more broadly. Activities would be undertaken in the following areas:

- Expansion and rehabilitation of irrigation within four irrigation schemes — Mlemele, Makwararani, Bumbwi Sudi and Chaani — including rehabilitation of 150 ha of existing irrigation infrastructure and expanding irrigation on an area of 620 ha.

- Development rainwater harvesting schemes under a well managed dry–land watered system in the command area of 3,196 hectares in Cheju, Muyuni, Mtende, Kibokwa, Kilombero and Bambi.

V.4. The project would give special attention in the construction of contour bunds for collection of surface runoff water where runoff is directly intercepted and stored in the soil profile for the crop growing area during rainfall. This system is based on harvesting rain water and conserving moisture but important secondary effects include nutrient harvesting and erosion control. Mechanical plowing of deep soil, using disking, sub–soiling or chiseling and animal traction plowing in the relatively shallow and light soil would be employed in combination with the water harvesting technique to improve water conservation.

Component 1.2: Strengthening irrigation management capacity

V.5. In order to support investment in irrigation and water harvesting infrastructure, the project would build the capacity of communities, private sector, and NGOs to support project implementation and maintenance of water harvesting/irrigation structures. The program would also focus on enhancement of farmers' skills for operation and maintenance of irrigation infrastructure through a training program for IA management designed to provide IA leaders with training services to improve their management skills and manage their organizations successfully. This component would also include provision of training courses to MANREC so as to fill gaps in qualified staff in the respective disciplines.

<u>Component 2:</u> Promoting Soil Fertility Improvement and Catchments Management Approach

V.6. The second component would address the problem of declining soil fertility and land degradation caused by lack of an integrated catchments approach. Extension services and awareness raising activities would be extended beyond the irrigation/rainwater harvesting command areas to the entire catchments in order to reach the farming population cultivating along hill terraces and water sources. Activities would include sensitization on appropriate farming–systems in order to protect the catchments against environmental degradation, and capacity building and productivity improvements for catchments farmers and communities. The component would also help develop a mechanism for catchments management and planning that incorporates downstream and upstream stakeholders.

<u>Component 3:</u> Strengthening Management/Financial Capacity of Farmers' Organizations

V.7. To–date Zanzibar has not developed an agricultural credit and rural finance policy to guide financial institutions operations with respect to serving rural clients. Other major constraints facing access to financial services include:

- Lack of clear policy objectives and guidelines with respect to rural financial services;
- Lack of legal and regulatory framework to guide Micro–finance Institutions (MFIs) and the operations of SACCOs, particularly for the protection of depositors' interests;
- Lack of saving mobilization for the generation of loanable funds;

- Over–dependence on donors and external funds for provision of loans for promotion of pre–determined technologies;
- Inadequate management capacity in grassroots MFIs;
- Lack of adequate governance and supervision of SACCOs and other informal savings and credit groups;
- Inappropriate loan guarantee and a lack of linkages between banks and MFIs;
- Lack of integrated management information system within MFIs, which prevents effective individual loan monitoring and follow–up.

V.8. The third component would try to address some of the issues identified above within the context of farmers organizations. For farmers' organizations to play a role that includes functions broader than the management and distribution of irrigation water or the maintenance of the canals, it will be important to develop stronger farmer associations. This component would enhance management capacities of farmers in entrepreneurship, organizational and marketing skills. Through their groups, farmers would be encouraged to engage in income generating activities and through joint responsibility would access inputs, markets, financial services and processing and storage facilities. For the purpose of deepening financial intermediation among the farming communities formation of the sustainable *Saving and Credit Association* (SACAs) and *Savings and Credit Cooperatives* (SACCOs) would be encouraged and the programme would potentially establish revolving fund/credit systems. The project would develop modalities of organizing farmers to form *Village Development Associations* (VDAs) that would have the functions to jointly provide services related to provision of tractor services, provision of seeds and fertilizers, collection of water fees, and to perform O&M related activities.

V.9. It would also be important to identify the institutional or policy constraints affecting farmer organizations and related service providers or suppliers (such as credit or inputs). An examination of the legal, policy and institutional framework would be essential to address the underlying issues affecting both irrigation authorities, farmers, and the private sector.

<u>Component 4:</u> Strengthening Research and Extension Services

V.10. The programme would include a component on research and extension services to provide farmers, and IAs/farmer organizations with services to improve production and marketing of their crops. A variety of research and methodologies would be used. In research, the component would support adaptive research trials through the use of *Farmer Research Groups* (FRG) and demonstration plots in farmers' fields using F*armer Extension Groups* (FEG). Particular attention would be placed on selecting promising new varieties and in promoting soil fertility improvement. In order to give farmers in the programme area more exposure and opportunities for exchanging ideas and experiences, exchange visits would be organized for farmer members of *farmer field schools* (FFS), research groups, and other farmers associations to similar groups elsewhere within and outside Zanzibar. Training, TA and seminars would be provided and organized to enable the farmers to become aware of the impacts of various policy issues and regulations that directly and indirectly affecting their production system, profitability and marketing opportunities and the measures needed to minimize these risks and uncertainties. Requisite training would also be provided to farmer groups and association on input supply and marketing focusing on multiplication of clean disease free seeds and planting material for sale to fellow farmers and maintaining quality standards.

V.11. In addition, through established FRG, FEG and FFS, the programme would investigate options for a farmer–contracting system for production of pure seed including organizing on–farm training of the farmers on production and preservation and distribution methods of good quality seed. Introduction of appropriate technology such as animal drawn oxcarts and implements would also be piloted in collaboration with other institutions/private sector.

VI. INDICATIVE COSTS

VI.1. A preliminary financial budget estimate for 5–year period is US$11.6 million. Cost Summary by component is indicated in the table below:

Component	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Water Resources Management and Infrastructure	2,277,928	1,340,852	636,778	871,047	904,695	6,031,300
Promoting Soil Fertility Improvement and Catchments Management Approach	875,528	437,764	328,323	328,323	218,882	2,188,820
Strengthening Management/Financial Capacity of Farmers' Organizations	100,284	200,568	75,213	75,213	50,142	501,421
Strengthening Research/Extension Services	120,426	240,852	90,320	90,320	60,213	602,131
Program Coordination, Monitoring/Evaluation	907,086	566,929	340,157	226,772	226,772	2,267,715
Total	4,281,252	2,786,966	1,470,791	1,591,674	1,460,704	11,591,387

VII. PROPOSED SOURCES OF FINANCING

VII.1. This program is expected to be financed largely by donors (89 percent). The government would grant all facilities necessary for the successful implementation of the project. Donors would cover costs of training and rehabilitation/improvement costs, purchase of vehicles and equipment, and cost for engineering services. The GOZ would provide manpower, in the form of engineers, support staff and project office as well as administration cost for the project implementation. Farmers would contribute 5 percent of rehabilitation and improvement costs through provision of their labour force and locally available construction materials, such as stone and sand. Additional funding from donors amounting to US$10.3 million would be required to support the program implementation. The support of NEPAD Secretariat to the Zanzibar Government is essential to identify a suitable source for this incremental finance.

VIII. PROJECT BENEFITS

VIII.1. The project is expected to bring the following benefits:

- Strengthened management capacity of farmers' organization.
- Rehabilitation or improvement of irrigation infrastructure through promotion of beneficiary (farmers') participatory and decentralization approach;
- Skills for O&M of irrigation infrastructure enhanced;
- An effective local capability created through training of staff, farmers, service providers, and associated entrepreneurs;

- Enhanced household food security through assisting farmers to attain increased production per unit area by improving management capacities of farmers in production (rice and vegetables), entrepreneurship, marketing, and crop production skills.
- Strengthened capacity of extension staff and farmers.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. The project would be implemented in accordance with the *Action Plan* of the ZIMP and the *"Feasibility Study for the Development of the Agricultural Sector in Zanzibar"*. The project is scheduled to take five years for surveys, planning, construction, and follow up of the scheme (depending on the command area and mobilization works), including training of irrigators associations and technical staff of the ministry. The construction works for the facilities such as headworks, pump station and main, secondary, and tertiary irrigation canal system, drainage canals, and farm roads would be carried out by both private contractors and farmers.

IX.2. In line with the concept for the participatory approach, parts of the construction works would be contracted out to farmers as much as possible, providing their labour force and construction materials, such as stone, sand, etc. In such cases, government staff would take necessary quality control measures to keep the works implemented by farmers up to normally acceptable standards. Construction works and/or O&M works by communities would be carried out in phases to avoid interference with the main farming season.

IX.3. The project would be carried out under the umbrella of the MANREC, Zanzibar. Under this Project the ministry would establish a *Project Facilitation Unit* (PFU) which would be headed by a Project coordinator. The PFU would be responsible for fund disbursement for project activities, procurement and organization of training and workshops for capacity building. PFU would also be responsible for project day–to–day activities, monitoring and evaluation. MANREC would also institutionalize an *Inter–ministerial Steering Committee* that would oversee the functions of PFU, approve work plans and budgets and provide technical guidance on implementation of the project activities. The representatives of the Steering Committee would comprise a multidisciplinary team from its own Commissions/Directorates, key line ministries, and NGOs and farmers representatives.

IX.4. The project would be implemented at different levels: the national, island and regional level; and district and local level. At national and island level, MANREC would have prime responsibility for implementation, but as they are based on Unguja, would assign a *Programme Coordinator* for Pemba located in the office of the MANREC (Officer–in–charge, Pemba). RADOs located at regional level would have supervisory functions, each having only two districts (5 regions and 10 Districts cover the whole of Zanzibar). Key activities would take place at district, jimbo and shehia level using existing staff and structures, including the same *District Management Team* approach set up under PADEP.

IX.5. ***Monitoring and Evaluation.*** Funds would be provided to the *Planning Department* of MANREC, RADOs and DADOs to put in place a comprehensive project monitoring system, and to help strengthen their overall Monitoring and Evaluation of MANREC activities. Special attention would be given to both strengthening M&E at district level, and developing participatory M&E systems for beneficiaries, including all the necessary training. An effort would be made to develop a participatory monitoring and evaluation system consistent with the National Poverty Monitoring System. Farmers and communities would be empowered to design their own log frame and impact

analysis framework that would form the basis for monitoring and evaluation of the system. Farmers themselves would be assisted to develop basic indicators which would help them to assess programme performance. With participatory monitoring and evaluation data would be collected at the farmers level and aggregated at district and central government levels for monitoring the programme progress and its complimentarily with other ongoing development programmes. Key elements in M & E are likely to include:

- Baseline data and information to derive benchmark measures for current levels of farmer technology use and knowledge, organisational capacity, and access to and use of services. The activity would consist of four data collection exercises which would: (i) extract results from the ongoing *National Sample Survey of Agriculture*, (ii) design and conduct a *Rapid Agricultural Sample Survey* (RASS), (iii) use results from the proposed District Surveys to be made at the outset of the project; and (iv) provide an inventory of private sector service providers.

- A participatory approach to M&E that would provide the opportunity for farmer groups and fora at village/shehia, ward and district level to assess progress and results against criteria defined by members themselves. This would include such tools as participatory OOD and logframe analysis.

- A progress reporting system at shehia and district level that would provide management at shehia, ward, district, region and national levels with key summary measures of performance.

- Periodic surveys to assess emerging effects and impact, including a bi–annual RASS and a repeat, but scaled down, *National Sample Survey of Agriculture* at the fifth year of the project.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. The programme would require both long–term and short–term TA inputs. ***Long–term TA*** would be needed in the fields of: (a) Project management (preferably a socio–economist); (b) Engineering and designs. ***Short–term TA*** would include (a) consultancy to review the statutory framework relevant to the establishment and legal functioning of farmer associations (FAs) and to develop a proper legislation and model by–laws for IAs; (b) marketing entrepreneurship; (c) networking of FAs; and (d) conducting of an environmental impact assessment.

XI. ISSUES AND PROPOSED ACTIONS

XI.1. There are several areas — institutional as well as technical — that would be examined in detail as part of further processing of this programme:

- ***Provision of support to other MANREC departments and divisions.*** MANREC is the core ministry in the implementation of this project. Its role and responsibilities would be to coordinate all other relevant ministries to provide support to the programme implementation, particularly for critical cross–cutting issues: gender, youth employment, nutrition and HIV/AIDS. MANREC would also have the responsibility of fostering collaboration of the Private Sector in service delivery. This being the case, MANREC's Departments of Planning, Irrigation and Cooperatives would need to be strengthened for

effective program implementation. An assessment of capacity should be undertaken during preparation of the programme.

- ***Legal framework.*** Presently there is a weak legal framework for *Irrigators Associations* (IAs). Since such associations are intended to play a role that includes functions broader than the management and distribution of irrigation water or the maintenance of the canals, it is important that institutional issues related to water management and irrigated agriculture sector be evaluated to identify policy or institutional gaps (including any barriers to legalization of IAs).

- ***Environmental and social impacts.*** So far, preliminary environmental assessments for the proposed sites show the need for further assessment of the targeted water harvesting/irrigation development areas. Various social and economic issues such as involuntary resettlement, substantial changes in the way of life, impacts on native people and population increase should be considered.

- ***Watershed management.*** Watershed management is closely linked to management of steep slopes, erodible devastated lands and soil erosion due to clearing perennial vegetation. The expansion of slash–and–burn farming and growing urbanization, which is further accelerating the deterioration of watershed area and is related to complicated land ownership arrangements in Zanzibar, present a challenge to effective watershed management. Because irrigation development requires proper management of watershed area for the conservation of water resources, a special study on irrigation development and watershed management, with particular attention to the erosion and importance of land ownership, is recommended.

- ***Programme feasibility.*** The project would, in the mid–term, accommodate 10 sites of which four would be developed under irrigation command, and the remaining six locations would be put into rainwater harvesting schemes. At full operation the project would have developed 4,966 hectares (770 ha under irrigation and 3,196 ha under rainwater harvesting techniques) that would allow a double–cropping system and benefit 6,792 farming households. The technical feasibility of the programme and availability of water resources should be further assessed and confirmed during preparation.

- ***Participation.*** Participation is crucial to successful implementation of the programme. Mechanisms for ensuring the full and willing participation of local communities in the planning, implementation and monitoring of the program should be further developed. Participatory approaches would be needed to identify farmers' requirements and constraints in adopting new technologies and to help promote the formation of farmers' groups and water users associations for the sustainable operation and maintenance of the irrigation system.

- ***Input and output marketing.*** Based on the survey results of the four Model Irrigation Schemes, ensuring of inputs supply and establishment of proper marketing or output emerged as the most important cross–cutting issues among farmers involved irrigation. To ensure availability of inputs, insufficient supply and affordability should be addressed with approaches from the supply and demand sides. Supply of inputs such as improved seeds, fertilizer and agro–chemicals, together with procurement of tractors needs to be improved in order to promote the effect of irrigation development. Although paddy is the major target crop to be grown under irrigation conditions, this crop is mainly cultivated for the farmers' own consumption. Vegetable production is therefore recommended under the ZIMP in order to increase the income level of farmers, however, this would require

development of new marketing channels to ensure product can be sold. Further evaluation of input and output marketing issues should be undertaken during programme preparation to adequately address such issues.

XII. POSSIBLE RISKS

XII.1. The following main risks can be identified at this stage:

- Possible inadequate guidance from support services agencies, including research, Extension, Credit and Marketing, and from other stakeholders.
- Existence of ineffective cooperation and social coherence in the associations/cooperatives;
- Funding may not be made available in time even after being approved by financers;
- Incidence of natural and human disasters;
- Inadequate cooperation with local stockiest and traders that could ensure timely availability of farm inputs at the farm gate.
- Unfavourable marketing system for sale of farm products.