Chapter 1 Introduction

1.1 Introduction

This Report was made in accordance with the Scope of Work (S/W) and its amendment on the Study on the Small Scale Horticultural Development Project for Poverty Alleviation to Farmers in Coast Region that was concluded between Japan International Cooperation Agency (JICA) and the Coast Regional Commissioner's Office of the United Republic of Tanzania on 15th April 1999 and 14th November 2000 respectively.

The Verification Study was undertaken following the report on the above-mentioned Development Project Study issued in November 2000. This report on the Verification Study is an attached report to the Development Project report. It includes the following parts: background of the study, review of master programme and action plan, verification study, final master programme, and conclusion and recommendations.

1.2 Background of the Verification Study

Tanzanian agriculture is a key industry that contributes 45% of GDP (as of 2002), 75% of export amount and employs 84% of workforce. Agricultural land is 5.9 million ha or 6% of total national territory of 943 thousand km². Small-scale farmers use 4.5 million ha of the agricultural land or 76%. Irrigated land shares only 4% of the land. Therefore, rainfed agriculture is common with low productivity. Agriculture is vulnerable to climate changes, which brought many droughts since the middle 1970's. Inactivity of the agricultural sector has hampered the economic progress of the country.

Agricultural production in Tanzania has totally been balanced between supply and demand, however, local food shortage has occurred due to local drought and poor marketing system. Food import including foreign assistance has increased since the early 1990's due to population growth. Cash crops such as coffee, cotton, pyrethrum, cashew nut, have been produced for export. International prices, however, have contributed in decreasing the share of these crops in the export value.

Coast Region, which included Dar es Salaam, was once the richest region of the country. However, it has become the poorest since being separated from Dar es Salaam in 1979. Furthermore, rural exodus from neighbouring regions to Dar es Salaam for job seeking has contributed to the increase in population growth and the expansion of poor people in the Region.

Owing to such circumstances, the Government of Tanzania planned the horticultural development project for small farmers in the Region for the purpose of poverty alleviation and requested to the Government of Japan a feasibility study on horticultural development in the four villages in the Region in September 1998. The Japanese Government sent a pre-feasibility study mission in April

1999. Both governments agreed to implement a master plan (M/P) study in an extended area of the Region and a feasibility study (F/S) in selected priority areas, and signed the S/W.

The Study was carried out in close collaboration between the Japanese side and the Tanzanian side in accordance with the said S/W, and was thus completed. During the course of the Study, both parties have recognised the necessity of the verification study in order to prove the viability of programmes and reveal unforeseeable constraints, if any, for the finalisation of the M/P and the Action Plans. As a result, the Japanese side has decided to undertake the Verification Study as a part of the Development Project Study, in response to the request of the Coast Regional Commissioner's Office dated September 2000. Consequently, the both sides signed the aforementioned Amendment of the Scope of Work.

1.3 Objectives of the Verification Study

The objectives of the Verification Study are as follows.

1) To verify the efficiency and relevance of the Development Plan (Master Programme and Action Plans). The results of the Study shall contribute to the finalisation of the Development Plan, revising its contents in accordance with the results, if necessary, and projects suitable for the ability of the inhabitants in the study areas and the executing organisation shall be proposed.
2) To provide the counterparts (the regional officers, district agricultural officers, officers of the Ministry of Agriculture and Food Security) and inhabitants in the study areas with capacity building aiming at the improvement of the living standard through technology transfer in the course of the Study.

1.4 Study Area

Some micro projects in the Verification Study are intended for all areas in the region, and others for only specified sites. The study area in a wide sense covers a whole five-district area, i.e., Kibaha, Bagamoyo, Kisarawe, Mkuranga and Rufiji districts, and includes nine villages/sub-villages in the region, namely Viziwaziwa, Mwanabwito, Mwendapole, Kwa Mfipa and Zegereni in Kibaha district, Vigama in Kisarawe district, Mwanambaya and Mkuranga in Mkuranga district, and Ruvu Darajani in Bagamoyo district. Magomeni town in Bagamoyo district was omitted from the target area in the early stage of the study because the villagers' needs did not meet with the concept of the verification study. The following table gives the general features of the specific study sites.

Table 1.4.1 Basic Information of Study Sites

Item \ Study Site (District)	Viziwaziwa (Kibaha)	Mwendapole* (Kibaha)	Kwa Mfipa* (Kibaha)	Mwanabwito (Kibaha)	Ruvu Darajani (Bagamoyo)	Vigama (Kisarawe)	Mwanambaya (Mkuranga)	Mkuranga (Mkuranga)
Status in M/P	Priority area			Priority area		Priority area	Priority area	
Horticultural Zone	High Input Vegetable			Low Input Veg.		Fruit		
Distance from DSM (km)	60	55	55	80	80	30	30	40
Landform	Undulating			Floodplain		Hilly		
Population	1,599	6,113	6,113	1,950	2,500	525	4,464	2,052
Number of household	403	1,254	1,254	273	305	122	992	669
Total area (ha)	2,000			2,800		400	3,200	
Population density (/km^2)	80			67		124	141	
Area for food crops (ha)	200			200		80	485	
Area for vegetables (ha)	25			40		5	40	
Area for fruit crops (ha)	120			80		80	1,010	
Extension service	VAEO	VAEO	VAEO	WAEO (VAEO)	VAEO	VAEO	VAEO	VAEO (WAEO)
Farmers' group	yes	yes	yes		yes	yes		yes
NGO support	yes	yes	yes	yes	no	yes	yes	no

Remarks: *: Total number of former Mwendapole village including present Mwendapole and Kwa Mfipa.
VAEO: Village agriculture extension officer (intensive)
WAEO: Ward agriculture extension officer (not intensive)

1.5 Scope of the Verification Study

The Study was conducted in four fiscal years and divided into two phases i.e., Phase 1: Preliminary Drawing-up of the Verification Study Implementation Plan and Phase 2: Implementation of the Verification Study, its Monitoring & Evaluation and Finalisation of the Final Report. The Study period was 38 months from January 2001 to March 2004. The following table outlines the implementation schedule of the Study.

The preliminary Drawing-up of the Verification Study Implementation Plan was carried out in the first fiscal year. The Study was implemented in the second and third fiscal years to confirm its efficiency and to carry out the capacity building for the persons concerned as well. In the fourth fiscal year, items of the Study that would be confirmed viable were carried out without the assistance of the Team that was in charge of only monitoring and evaluation.

Table 1.5.1 Implementation Schedule of the Verification Study

Phase/FY	Stage	Work Item
Phase 1: Preliminary Drawing-up of the V/S Implementation Plan		
Fiscal Year 1	Preparatory Works at Home	・ Collection and review of relevant information ・ Outline of overall work strategy ・ Preparation and submission of Inception Report
	Field Study 1	・ Explanation and discussion on Inception Report ・ Workshop ・ Setting up indicators for monitoring/evaluation and their baseline confirmation ・ Preparation of Preliminary Plan of Operation of the Verification Study
Phase 2: Implementation of the V/S, its Monitoring & Evaluation and Finalisation of the Final Report		
Fiscal Year 2	Works in Japan 1	・ Preparation of Plan of Operation of the Verification Study
	Field Study 2	・ Explanation and discussion on Plan of Operation of the Verification Study ・ Construction of district seedling firm ・ Preparation of input credit ・ Construction of multipurpose shed and flour mill house ・ Improvement of watering ・ Preparation, explanation and discussion on Monitoring Report (1) ・ First input credit ・ Promotion of group activities and training for group leaders ・ Farmers' training ・ Preparation, explanation and discussion on Monitoring Report (2)
Fiscal Year 3	Field Study 3	・ Second input credit ・ Farmers' training ・ Maintenance of facilities for the Verification Study ・ Preparation, explanation and discussion on Monitoring Report (3)
	Field Study 4	・ Third input credit ・ Farmers' training ・ Mid-term Evaluation study
	Works in Japan 2	・ Preparation, explanation and discussion on Mid-term Evaluation Report
Fiscal Year 4	Field Study 5	・ Monitoring ・ Preparation, explanation and discussion on Monitoring Report (4)
	Field Study 6	・ Monitoring ・ Final Evaluation
	Works in Japan 3	・ Preparation and discussion on Draft Final Report
	Field Study 7	・ Explanation and discussion on Draft Final Report
	Works in Japan 4	・ Finalisation of Final Report and Handbook of Useful Techniques

Chapter 2 Background of the Study

2.1 Recent Situation of Tanzania

The original Master Programme was planned on the basis of the socio-economic situation, natural conditions, performance of agricultural sector and development strategies of the country and the region, which were explained in the Master Programme report of November 2000. This section gives the summary of country situation based on the most recent published information.

2.1.1 National Economy

The following table gives the recent macro economic indicators of Tanzania referred to in the World Bank's published country profile. The Gross National Income per capita was estimated at US$ 280 in 2002, which is less than US$ 1.00 per day, although this value has increased 22% since 1998. The Gross Domestic Product was US$ 9.4 billion in 2002 with a growth rate of 5.8% per annum. The value added in the agriculture sector is kept at about 45% of GDP. The trade balance is in excess of imports, where exports and imports of goods and services are 16.3% and 24.4% of GDP.

Table 2.1.1 Major Economic Indicators of Tanzania

Indicator	1998	2001	2002
GNI, Atlas method (current US$ billion)	7.5	-	9.6
GNI per capita, Atlas method (current US$)	230.0	-	280.0
GDP (current $ billion)	8.4	9.3	9.4
GDP growth (annual %)	3.7	5.7	5.8
GDP implicit price deflator (annual % growth)	14.2	6.6	4.2
Value added in agriculture (% of GDP)	44.8	44.8	44.7
Value added in industry (% of GDP)	15.4	15.8	16.0
Value added in services (% of GDP)	39.8	39.4	39.4
Exports of goods and services (% of GDP)	13.6	15.6	16.3
Imports of goods and services (% of GDP)	28.3	24.3	24.4
Gross capital formation (% of GDP)	13.8	17.0	17.4

Source: World Development Indicators Database, August 2003

2.1.2 Socio-economy

The 2002 Population and Housing Census was conducted in the country, which follows the last 1988 censuses. The compiled data are accessible on the WEB site. The total population of Tanzania is 34.57 million, consisting of 33.58 million in the Tanzania Mainland and 0.98 million in Zanzibar. The population growth rate is as high as 2.9% per annum. The total number of households is about 7 million, and the average size of households is 4.9 members. The population density is 39 people per km^2 in national average.

The Household Budget Survey 2000/01 was carried out in 20 regions of the Tanzania Mainland. The survey items consisted of household and housing, education, health, drinking water, economic

activities, and consumption and poverty. The major survey data are compiled in the following table.

Table 2.1.2 Data of Household Budget Survey 2000/01

Item	Coast Region	Tanzania Mainland	Rank of Coast in 20 Regions
Household and Housing			
% households with modern walls	6	25	16
% households with modern roof	33	44	12
% households connected to electricity grid	6	10	8
% households using a toilet	98	93	4
Education			
% of all adults without education	39	25	3
Primary net enrolment ratio	56	59	13
Mean distance to a primary school (km)	1.7	1.8	9
Health			
% of individuals ill in 4 weeks before the survey	34	27	1
% of ills/injured who consulted any health-care provider	83	69	2
Mean distance to a hospital (km)	24.5	21.3	6
Drinking Water			
% of households with piped or protected drinking water	35	55	17
% of households within 1 km of drinking water (dry season)	56	55	8
Economic Activities			
% of adults in agriculture	62	62	15
% of children (5-14) working	57	62	11
Mean land owned by rural households (acres)	2.9	5.3	16
Consumption and Poverty			
Mean expenditure per capita (TShs, 28 days)	10,500	10,100	6
% of population below food poverty line	27	19	5
% of population below basic needs poverty line	46	36	4
% of consumption expenditure on food	69	65	3

Source: Household Budget Survey 2000/01, National Bureau of Statistics Tanzania, 2002

2.1.3 Agriculture

The main crop production of Tanzania in 2002 is summarized in the following table, according to FAO's online database.

Table 2.1.3 Production Data of Major Crops in Tanzania in 2002

Crop	Area Harvested (ha)	Yield (kg/ha)	Production (ton)
Maize	1,580,000	1,709	2,700,500
Rice, Paddy	401,070	1,282	514,000
Cassava	660,900	10,422	6,888,000
Pulses, Total	775,000	574	445,000
Tomato	18,000	7,778	140,000
Onion	19,000	2,947	56,000
Garlic	350	5,714	2,000
Cashew nuts	9,000	1,354	121,900
Coconuts	310,000	1,194	370,000
Citrus Fruits (Total)	7,300	5,343	39,000
Mangoes	18,500	10,270	190,000
Pineapples	8,800	8,636	76,000

Source: FAOSTAT Agriculture Data (On-line Database)

2.1.4 National Development Plan

The Government of Tanzania prepared and adopted the Development Vision 2025 in 1999 and the National Poverty Eradication Strategy (NPES) in 1997, which spell out a vision for the society with abject poverty and improved social condition. The Tanzanian Government also prepared the Tanzania Assistance Strategy (TAS) in 2000, which provides the national strategic framework for guiding external aid programs in Tanzania. In accordance with these policies, the Poverty Reduction Strategy Paper (PRSP) was finalized in October 2000. The assessment of the PRSP recommended the early preparation of the strategies in agriculture, rural development, and primary education sectors.

Tanzania practiced the sector programme approach prior to the process of the PRSP, and such an approach has accelerated in the framework of the PRSP. The Government of Japan has dealt with the Tanzanian agricultural development as an important sector in the economy. Based on such experiences, the Japanese Government has performed the secretariat of the working group, which was established between the Tanzanian Government and Donors in order to prepare the Agricultural Sector Development Strategy (ASDS), Agricultural Sector Development Plan (ASDP), and Rural Development Strategy (RDS). In accordance with ASDS prepared in 2001, ASDP was formulated as an implementing programme of the strategy, and a part of ASDP is put into implementation at present. Recently, the District Agriculture Development Plan (DADP) has been prepared in accordance with ASDP, and implemented step by step.

2.2 Recent Situation of Coast Region

The situation of Coast region is also described in detailed in the master programme report issued in November 2000. This section gives the important parts of the 2000 report with recent data and information.

2.2.1 Natural Conditions of Coast Region

(1) Location and Topography

The Region is situated on the eastern part of Tanzania Mainland along the coastal belt of the Indian Ocean. It is located between latitudes 6° and 8° South of the equator and longitudes 37°30' and 40° East of the Greenwich line. The Region covers an area of 33,539 km^2 in total, where dry land area is 32,407 km^2, equivalent to about 3.8% of the total area of Tanzania. The coastal area that rises from 0 to 100 m above sea level is covered by sandy loam soil except the lower land areas covered by heavy clay waterlogged soil suitable for high delta crops. Toward the western part of the Region, the coastal hills and highland extend, which rise from 100 m to 480 m above sea level.

(2) Climate

The Region is placed on the eastern part of Tanzania Mainland along the Indian Ocean lowland, where

the weather is generally hot with periods of high humidity. The salient climatic features of the Region are shown in the following chart. Annual rainfall in the Region varies from 800 mm to 2,000 mm depending on areas and years. There are two rainy seasons, i.e., the long rainy season and the short rainy season. The long rainy season lasts for around 90 days between March and May with about 55% of the annual precipitation. The short rainy season spans about 60 days between October and December with about 27% of the annual precipitation. The rains during the short rainy season are not evenly distributed, and sometimes not reliable. The period from June to October is cooler and drier and rainfall during this period is generally associated with locally generated convectional storms of limited extent.

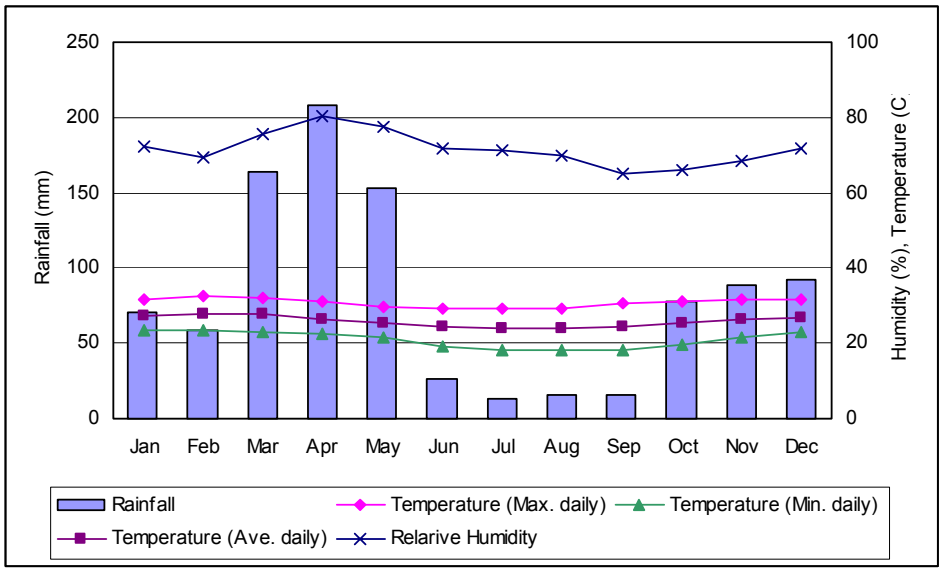

Fig. 2.2.1 Salient Climatic Features of Coast Region (1979-1998)

(3) River System

There are three main rivers, namely the Wami River, the Ruvu River and the Rufiji River, all of which traverse the Region. The major drainage areas in the Region are divided into four systems. Flow characteristics of the drainage systems are summarised in the following table.

Table 2.2.1 Flow Characteristics of Drainage Systems in Coast Region

Drainage System	Catchment Area (km^2)	Area under the Region (km^2)	Maximum Flow ($m^3/s/km^2$)	Average Flow ($m^3/s/km^2$)	Minimum Flow ($m^3/s/km^2$)
Wami Drainage	36,450	4,711	0.0201	0.0027	0.0003
Ruvu Drainage	15,190	7,533	0.0347	0.0054	0.0008
Rufiji Drainage	154,000	6,334	0.0261	0.0046	0.0012
Coastal Drainage	-	13,311	-	-	-

Source: Hydrological Year-Book 1965 – 1970, Ministry of Water

(4) Groundwater

The three major rivers of Wami, Ruvu and Rufiji form the topographic land. Two of these rivers, the Ruvu and the Rufiji, define three geo-hydrologic zones in terms of geology, groundwater regime and potential groundwater utilisation. There are seven geo-hydrologic zones in total within the Region, adding other zones defined by other rivers.

There are a number of shallow wells and shallow pits (called Kisima) in the Region. The shallow pits are the most common sources of water in the Region. These pits are generally located in valleys and depressions reflecting the availability of shallow groundwater. The depth of these shallow pits is very shallow and varies from 1.0 to 1.5 m, and most of them meet the water requirement in the dry season.

(5) Soil

As for the soils in the Region, loamy sand, sandy loam and sandy clay are dominant in the inland part. Sandy soil exists along the coastal areas. Clayey soil is found along the Ruvu River and at the estuary area of the Rufiji River. The mouth of the Wami River is covered by loamy soil. The soil with poor drainage extends in the northern part along the Ruvu River, the Wami River and lower reaches of the Rufiji River. The north-western, central and southern parts of the Region are widely covered by soil that moderates drainage conditions. In the soil capability classification, the central part and the three river basins are identified as preferable soil characteristics with moderate or moderately severe limitations that restrict the range of crops or require moderate or special conservation practices.

(6) Land Use

The cropland, which is under cultivation of various cash and food crops, covers 2,991 km^2 (8.9% of the total area that is 33,539 km^2). The state farms, where various activities such as dairy cattle farming, beef cattle ranches and plantations, exist in the area of 1,021 km^2 or 3.0% of the Region.

The classification of agricultural land use is rather difficult to identify because most of the farmland is of mixed farming with various kinds of tree crops and herbaceous crops. Based on the interpretation of satellite images and field verification, the area of mixed cropping where scarce tree crops and annual crops grow is estimated at 93,816 ha or 2.9% of the total area of the Region. The area under cultivation with tree crops where dense tree crops and some annual crops are found is estimated to cover 264,614 ha or 8.3% of the Region. The area under cultivation with herbaceous crops where food crops grow widely is estimated at 43,533 ha or 1.4%.

2.2.2 Socio-economic Situation of Coast Region

(1) Population

According to the 2002 Population and Housing Census, the total population of Coast Region is 889,154 consisting of 440,161 of male and 448,993 of female. The population growth rate is 2.4%, which is lower than the national average of 2.9%. The population density is 27 people/km^2 in average, but there are two groups; i.e., over 70 people/km^2 for Mafia, Mkuranga and Kibaha districts and around 20 /km^2 for Rufiji, Kisarawe and Bagamoyo districts. The total number of households is 200,919 and the average household size is 4.4 people, which is smaller than the national average of 4.9 people.

Table 2.2.2 Demographic Data by District in 2002

District	Male	Female	Total	Area (km^2)	Density (/km^2)	Household	Average Size
Coast	440,161	448,993	889,154	32,407	27	200,919	4.4
Bagamoyo	114,699	115,465	230,164	9,842	23	50,359	4.6
Kibaha	66,291	65,754	132,045	1,812	73	30,477	4.3
Kisarawe	48,343	47,271	95,614	4,464	21	22,949	4.2
Mkuranga	91,714	95,714	187,428	2,432	77	42,937	4.4
Rufiji	98,398	104,704	203,102	13,339	15	44,342	4.6
Mafia	20,716	20,085	40,801	518	79	9,855	4.1

Source: 2002 Population and Housing Census

(2) Poverty and Human Development

The Regional Human Development Index (HDI) and Human Poverty Index (HPI) are measured to assess regional differences in the status of poverty and human development, in the course of the implementation of the Poverty Reduction Strategy in Tanzania. The HDI is a composite index measuring average achievement in three basic dimensions of human development, i.e., a long and healthy life, knowledge and a decent standard of living. While, the HPI is a composite index measuring deprivations in the three basic dimensions captured in the HDI.

According to the "Poverty and Human Development Report 2002", the HDI and HPI of Tanzania Mainland is 0.482 and 36.3, respectively. Dar es Salaam and Kilimanjaro Regions rank highest for both indexes. The HDI value of Coast Region is 0.449, and the region ranks 11 among 20 regions of Tanzania Mainland. On the contrary, the HPI value of Coast Region is 44.9, and the region ranks 18. The cause for the different ranking of the region can be found in the choice of indicators reflecting the three dimensions of human development. The expenditure component for which it performs well in the HDI pushes it up the ranks. Leaving consumption expenditure out of the equation and introducing access to safe water, for which Coast Region is not performing well, causes this region to rank 18th in the HPI.

Table 2.2.3 Human Development Index and Human Poverty Index

Item	Coast Region	Tanzania Mainland
Life expectancy at birth (years), 1988	48	50
Adult literacy rate (% age 15 and above), 2000	61	71
Primary gross enrolment ration (%), 2000	79.7	84.9
Mean monthly consumption expenditure per capita (TShs '000), 2000	10.5	10.1
Life expectancy index	0.383	0.417
Education index	0.672	0.756
Expenditure index	0.293	0.273
Human Development Index (HDI) value	**0.449**	**0.482**
Probability at birth not surviving to age 40, 1988	0.46	0.43
Adult illiteracy rate (% of age 15 and above), 2000	39.0	29.0
Population without access to safe water, 2000	65.2	44.3
Underweight children under age 5 (%), 1996	34.3	29.4
Human Poverty Index (HPI) value	**44.9**	**36.3**

Source: Poverty and Human Development Report 2002

(3) Road

Roads in the Region are classified into four categories, namely, Trunk Roads, Regional Roads, District Roads and Feeder Roads. The trunk roads are the most highly trafficked with an average of up to 2,200 vehicles in a day, while the feeder roads are with single lane width having the minimum traffic. The distribution of road network by district is shown in the following table.

Table 2.2.4 Distribution of Road Network in Coast Region

District	Land Area (km^2)	Length of Road (km)					Road Density (m/km^2)
		Trunk Road	Regional Road	District Road	Feeder Road	Total	
Bagamoyo	9,842	154	353	73	382	962	98
Kibaha	1,812	45	53	243	148	489	270
Mkuranga	2,432	110	45	212	228	595	245
Kisarawe	4,464	0	161	121	479	761	170
Rufiji	13,339	118	122	215	424	879	66
Mafia	518	0	68	36	105	209	403
Total	32,407	427	802	780	1,624	3,633	101

Source: District Offices' data

The responsible agencies for road construction and maintenance are Regional Engineer Offices of Ministry of Works, Road Engineers of Regional Secretariats, and District Engineers of District Secretary's Offices depending on the road category. These responsible agencies have to deal with new construction work, rehabilitation, improvement and maintenance work of the roads, however, they are facing some difficulties in fulfilling their duties due to inadequate equipment, material, budget and so forth. The Tanzanian Government has targeted to begin with improved maintenance of roads before embarking on new road construction. The Region has earmarked a list of priority roads to receive regular maintenance.

The civil works on road construction or improvement/maintenance is to be conducted under contract

basis with private contractors in line with the Government policy of privatisation, but such a system has not work smoothly yet. In such hard circumstances, village governments are required to participate in carrying out minor maintenance works on roads in their respective areas.

(4) Water Supply

The overall objective of the Water Sector in the National Policy is to provide safe and clean water to the whole population within a distance of not more than 400 m by the year 2002. Ratios of coverage with clean water in the Region by the year 1996 were still 56% in rural areas and 48% in urban areas.

About 45% of the population in the Region is not covered by any kind of water supply schemes. A number of people depend on unreliable and unsafe water sources. Even the population served by existing water schemes is not always supplied with suitable and required amount of water regularly because of inadequate maintenance of the facilities, higher water utilisation beyond designed capacity and lack of water in the dry season. The Ministry of Water has design criteria for rural water supply with an average consumption of 30 lit/man-day. However, it is difficult to follow the criteria in all seasons due to the shortage of water especially in the dry season. In some rural areas, villagers can at best get 5 lit/man-day after transporting water by hand (head) from different sources located a few kilometres away from their dwellings.

2.2.3 Agriculture in Coast Region

(1) General

Agriculture, the most important economic sector, employs more than 90% of the population in Coast Region. However, 67% of the farmers in the Region and Dar es Salaam live mainly on off-farm income. The farmers whose main income source is crop production are 33%, and the activity in livestock is very low. An average family size of agricultural household is about 5.1 to 5.3 persons and the average household members working on farm are about 3.6 to 3.9 persons. The average land size is about 4 ha per agricultural household, while the average planted area is estimated at 0.7 to 0.8 ha in a season. The cultivation techniques on the crop production, such as irrigation, farm input, farm management and extension services, are less improved, even compared with the country level.

The main food crops in the region are cassava, sorghum, paddy, maize and legume (mainly cowpea). The area cropped by food crops is about 125,000 ha a year. The annual production of cassava is the largest amounting to as much as 478,000 tons, followed by paddy, maize and sorghum.

Cashew nuts and coconuts are very important cash crops for the Region also for a number of small farmers. Various horticultural crops are also produced in the Region, although the area under horticultural crop cultivation is smaller than that under food crop and cash crop cultivation. These cash crops and fruit are widely planted all over the Region for the outer large market and international

market. However, the vegetable production stands behind other developed regions, such as Arusha, Tanga, Morogoro and Mbeya.

Paddy, maize and sorghum are cultivated during the long rainy season. Some maize may be sown after the long rainy season using residual moisture or at the beginning of the short rainy season. Cassava is planted during the short and long rainy seasons and harvested after 8 to 10 months. The harvest season of fruit and nuts varies by crop. The planting season of the seedlings is mainly the beginning of the long rainy season.

(2) Horticulture

The Region produces various types of tropical fruits and some vegetables under higher temperature and higher humidity than other regions. The cultivated area of major horticultural crops, such as mangoes, pineapples, citrus fruits and tomatoes, is about 3,100 ha, although there is plenty of land suitable for the production. The regional government pointed out the main constraints hindering full development of horticultural crop production as; 1) inadequate horticultural technology for extension staff, including production technique, post-harvest handling (processing) and marketing technique, 2) poor road communication to production areas, resulting into delay in the delivery of these perishable crops, and 3) lack of processing facilities. Besides, the cashew and coconuts are produced as the largest income source in the regional economy. These two crops cover quite a large area, which amounts to 184,000 ha.

Cashew is the major cash crop in the Region, which contributes more than 30% of the total regional income. The Region had a total area of 100,000 ha planted with a total number of 8,300,000 cashew trees as of 1996. The area with cashew trees is equivalent to about 33.4% of the total land area under cultivation. The production of cashew in the region reached 12,200 tons in the year 1994/95. The area under coconut cultivation is estimated to 84,000 ha with 7,560,000 trees. The annual production of coconut is estimated at about 300,000 tons.

Regarding fruit, the area under cultivation of orange trees is estimated to be 880 ha with a high increasing ratio. Bagamoyo, Rufiji, Kisarawe and Mkuranga are the principal orange growing areas in the Region. Annual production of oranges in the Region is estimated at about 14,000 tons. Pineapples are produced in all districts of the Region on an area estimated to cover 1,200 ha. Bagamoyo, Kisarawe and Mkuranga are the major pineapple growing areas in the Region. Total production of pineapples in the Region is estimated at about 19,000 tons a year. An estimated area of 435 ha is under mango trees. Rufiji, Bagamoyo, Kisarawe and Mkuranga are the main districts producing mangoes. The total production of mangoes in the Region is about 5,000 tons a year. The shares of the production of oranges, pineapples and mangoes in the Region are estimated at 38%, 56% and 9% in national average production from 1990/91 to 1995/96.

Tomato, the dominant vegetable, is produced in all districts mainly along riverbanks, valleys, lowland area and other areas with fertile soil and water for irrigation. The total production of tomatoes in the Region is about 8,000 tons a year. It is equivalent to about 18% of the national tomato production.

Table 2.2.5 Features of Horticulture by District

District	Vegetables	Fruit Crops
Bagamoyo	Main vegetables are; Tomato (180 ha), Pumpkin (100 ha), Cucumber (20 ha), and Amaranthus (10 ha). Low-input production is commonly found in the Ruvu river basin. Some farmers near Bagamoyo town practice high-input vegetable production on commercial basis.	Major fruit crops are; Cashew (3,410 ha), Pineapples (380 ha), Mango (140 ha), and Orange (80 ha). Bagamoyo is a leading pineapple producer in the Region.
Kibaha	Main vegetables are; Tomato (130 ha), Okra (70 ha), Pumpkin (30 ha), Cucumber (30 ha), Eggplant (20 ha), and Amaranthus (10 ha). About 3/4 vegetables are grown with low-input in the Ruvu River basin. Some farmers along the Morogoro road practice high-input vegetable production on commercial basis.	Major fruit crops are; Cashew (17,760 ha), Citrus (120 ha), Pineapples (200 ha), Mango (60 ha) and Banana (38 ha).
Kisarawe	Main vegetables are; Pumpkin (30 ha), Tomato (20 ha), and Okra (10 ha). Most vegetables are grown with low-input at the Ruvu River basin.	Major fruit crops are; Coconut (16,170 ha), Cashew (14,930 ha), Orange (470 ha), and Lemon (60 ha). Tree/fruit crop cultivation is a mainstream of the district agriculture.
Mkuranga	Main vegetables are; Amaranthus (60 ha), Tomato (50 ha), Chinese Cabbage (40 ha), Pumpkin (30 ha), and Okra (20 ha). The activity in vegetable production is much lower than it is in tree crop production.	Major fruit crops are; Coconut (21,000 ha), Cashew (20,000 ha), Citrus (200 ha), Pineapples (200 ha), and Mango (70 ha). The scale of coconut and cashew is the largest in the Region.
Rufiji	Main vegetables are; Tomato (123 ha), Amaranthus (62 ha), Okra (22 ha), and Onion (12 ha). Northeastern part is a similar condition with Mkuranga district. Dry season vegetables are planted after paddy harvesting along the Rufiji River.	Major fruit crops are; Cashew (11,770 ha), Coconut (2,510 ha), Citrus (460 ha), Mango (170 ha), and Pineapple (90 ha).
Mafia	Vegetable production is very limited, and is for local consumption only.	Coconut (17,000 ha) is the dominant fruit crop covering all over the island.

Note: The growing areas are based on the questionnaire answered by the district agricultural officers and on the Team estimates. The areas are sometimes different from the statistical data provided by the regional offices.

Source: Agricultural officers of Districts concerned, and the Team

High quality seeds of vegetables are imported from other countries such as Kenya and European countries, and are available in local markets. Most farmers use seeds collected from their previous products, then they replace the exhausted seeds by new seeds after several seasons. Seedlings of fruit crops are mainly locally produced in the small plots of the farmers themselves or their neighbours. Each district has at least one seedling farm, which had produced and distributed a number of fruit crop seedlings under the responsibility of the Ministry of Agriculture and Cooperatives until their transference to the districts. However, almost all the farms have closed their operation because of the

lack of resources within the district governments.

In the Region, there is a big demand of seedlings for replacement in order to keep fruit productivity and marketability high. Moreover, it is very likely that the demand of citrus seedlings will grow in proportion to the expansion of citrus land, since this fruit is getting popular especially among urban citizens.

(3) Marketing and Processing

Marketing for vegetables in the study area is categorised into three types. The first type includs the river basin areas located along the Ruvu river or Rufiji river. In these areas farmers themselves principally consume vegetables, except tomatoes and pumpkins. Even though tomatoes and pumpkins are mainly produced for commercial purposes, farmers are usually waiting for traders and/or middlemen to come and buy their produce. The second type includes the area along the Morogoro road, where vegetables are mainly produced for commercial purposes. The vegetables are usually sold locally or at Dar es Salaam markets through small scale middlemen. The last type involves the other areas around towns, where vegetables are grown mainly for domestic consumption either in home gardens or open places using the available water.

The fruits produced in the Region are usually collected and transported by middlemen coming from Dar es Salaam. These middlemen sell them to wholesalers or commission agents at major public markets in Dar es Salaam.

There are no farmers' groups for horticultural marketing in the study area. Farmers are usually just waiting for retailers or middlemen to sell their vegetables and fruits individually. The reasons why farmers have not established farmers' groups for horticultural marketing seem to be (a) small quantities of commercial produce of vegetables, (b) lack of marketing facilities and farmers' awareness for group marketing.

The market prices of vegetables fluctuate seasonally. Although these fluctuations vary from produce to produce, higher prices can generally be observed during the dry season starting from January through the successive rainy season up to the end of July. On the contrary, cheaper prices can usually be seen in the period of July to October in which vegetable production in the study area is at a peak season.

The wholesale and retail marketing margins for potatoes, tomatoes, cabbages and onions are within the range of 15 - 40% and 10 - 60%, respectively. There are also considerable differences between retail and farm gate prices for the above vegetable produce. Retail prices are two to five times the farm gate prices.

The prices of horticultural produce are closely related with their quality. These variations arise from

various causes, and a major cause is the quality of produce, in particular sweetness, freshness, size, appearance and damage.

In the study area, there are no private factories for processing horticultural produce except Kibaha cashew nut processing factory, which is now closed. Otherwise individuals or groups of farmers operate some small-scale processing to produce jam, wine, pickles and juice.

(4) Agricultural Extension

The nationwide extension services initiated by the National Agricultural and Livestock Extension Rehabilitation Project (NALEARP), commenced in 1989 under the financial assistance of IDA, AfDB and the Government of Tanzania. The project introduced the Training and Visit (T&V) system in five districts and expanded the activities to 16 out of 20 regions of the Mainland Tanzania. The project was officially closed in September 1996. The National Agricultural Extension Phase II (NAEP II) was declared effective in October 1996 as the second phase of the long-term extension programme initiated by NALEARP. There are four major components under NAEP II, which are; institutional strengthening, extension education and training, communication support and pilot initiatives. The total project cost will amount to US$ 32.9 million with the implementation period of five years from 1996 to 2001.

The district agricultural extension services are headed by DALDO who is assisted by the District Extension Officer (DEO). There are District Subject Matter Specialists (DSMS) who provide technical advices for Ward Extension Officers (WAEOs) and Village Extension Officers (VAEOs). Currently, 137 district officers and 157 extension staff members are engaged in the services. Shortage of extension officers is a chronic problem nationwide. In the Region, the actual staff members account only for 33% of the requirements, resulting in insufficient delivery of extension services.

Agricultural research is one of the crucial aspects for a successful horticultural development. However, due mainly to financial constraints, horticultural research has not properly taken off in the Region.

(5) Farmers' Organisation

There are very few stable farmers groups in the Region. The groups are very fragile and often disintegrate soon after their formation. Most of the groups exist temporarily during the peak agricultural season. Their binding force is the acquisition of agricultural advice and sometimes combined financial efforts to acquire agricultural inputs. Unless farmers find a group profitable, they have no incentive to form it. In the long span, there are fewer possibilities about further development of grouping. However, since agricultural development cannot be achieved in a short term, farmers' organisation/group has to be made sustainable.

Group formation is promoted in several villages in the Region through NGOs' assistance. Among

various group activities as listed below, the ones under Swissaid and CBI are the most operational in terms of promotion of horticulture and other agricultural activities.

- Grant, SACCOs and Grameen (micro-credit) by Swissaid Tanzania
- Community Based Initiative (CBI) by UNDP
- Village Oriented Development Programme (VODP) by Caritas
- Heifer Project International (HPI)
- Astro Project
- Islamic Relief

(6) Rural Credit

No institutional credit schemes are operational in the Region, but the micro credit by NGOs is operated in connection with the promotion of group formation. The major ones are Swissaid and CBI. It is noted that the repayment rates for both credit schemes are as high as over 90%.

Swissaid Tanzania introduced the grant support system to Mwendapole in Kibaha district in 1993. The activities include dairy cow raising, carpentry, poultry farming, horticultural farming, etc. Following the successful grant system for six years from 1993 to 1998, the new credit scheme was introduced to Mwendapole in 1999. Swissaid has also introduced the grant support to Kisarawe. CBI project is a grass-root programme, which supports Community Based Organisations (CBOs) engaged in productive activities. The Ministry of Labour and Youth Development undertook this micro credit project with financial assistance from United Nations Development Programme (UNDP).

For CBI, the following loan conditions have to be strictly adhered to:

- Borrowers are the group members of CBO's Council in the districts and have to be recognised by village government or ward. Preference is given to youth and women groups. The qualification of borrowers is; a) to be in-groups of five to ten members, b) to be of a minimum age of 15 years old and above, c) to live in one project area for a minimum period of one year, and d) to live in that area for a period of not less than one year.
- Any lawful productive activity can be applied for a loan. The activity should be viable and active with optimum size for the number of proprietors. The activities should be growing nature and not affect/destroy the environment. Loan limit depends on the project actual needs. The amount of loan to be disbursed depends on the amount of group's saving or contribution. It does not exceed 600% of savings or contributions. To begin with, CBI provides loans not exceeding TShs 1.00 million for each CBO group.
- Group members secure the loan. They guarantee each other and group properties are part of security. In case a group member fails to repay loan during the repayment period, each member takes responsibilities to contribute for their colleague. In case the group fails to submit its repayments to the Council, the Council takes responsibilities to settle the outstanding amount. The interest rate is set to coincide with prevailing loan interests in the bank. The interest rates

are reviewed and adjusted every six months period. The interests are changed on the basis of agreement between the CBI project and CBO's Council. The average interest is currently set to be 15%. The loan repayment period is 12 months. In case the borrower succeeds in repaying his/her loan within the scheduled period, he/she has the right to borrow the next loan.

(7) Irrigation

For sustainable horticultural development in the study area, irrigation is essential and is required in most part of the year except a few months in the long rainy season. It is observed that farmers water horticultural crops during almost all the growing period. The horticultural farmers irrigate their own small plots by hand using a bucket or polly-tank. In that sense, the farmers' activity of providing water to the crops may not be seen as irrigation but rather as watering. Water sources for the watering are; ponds or water impounding, shallow pits (kisima), stream flow, and potable tap water provided through water service (observed in the urban area). Among these water sources, private shallow pits owned by individual farmers are the majority in the study area. Due to the high water table, farmers using these shallow pits can irrigate/water their plots a few months following the end of the long rainy season.

Present horticultural fields are generally located within close distance to some water sources due to the convenience of watering, which is a very tough daily work for farmers and their children. Portable engine pumps for lifting and delivering water are rarely seen in the study area due to the high investment cost involved and the unsuitable shape of the shallow pits.

The actual quantity of watering practised by farmers in the study area is much smaller than the standard values of irrigation requirements, because the farmers water only around crop roots. The actual water applied is estimated at about 2.0 mm/day through observation of real practice in the study area. This is because farmers decrease the water application by stopping watering when it rains or rain is anticipated and water around crop roots only as mentioned above. Since the farmers may barely feel the effect of saving water considering the excessive labour involved in watering, such a practice is not always the ideal water saving irrigation method in the study area.

(8) Drainage

Two types of drainage hazards are observed in the Region. One is the inundation problem during flood in lowland areas and along big rivers such as Wami, Ruvu and Rufiji. The other is the implicit hazard related to drainage problems such as the erosion caused by high rainfall intensity in agricultural fields located in hilly areas.

Big rivers are reliable and perennial water source, on the other hand they cause severe flooding periodically in the lowland areas where rice is cultivated. Horticultural practice has not been developed well in such lowland areas. Horticulture has considerably been practised in sandy upland

areas. While these areas are usually well drained with less diseases incidence, soil erosion occurs frequently due to heavy rains.

Chapter 3 Framework of Master Programme and Action Plan

3.1 Constraints to Development

The social infrastructure, such as roads, water supply, electricity and telecommunication facilities along with, school and medical facilities that is the basis of human life, is not sufficiently provided in the Region. There are also constraints that hamper agricultural development such as limitation of market demand and irrigation water and so forth. Moreover, there exist such socio-cultural constraints as a bigger voice of seniors and a smaller one of women and youth. Within such constraints, only horticultural development that is one part of agriculture is not sufficient to contribute to poverty alleviation. Therefore, this programme aims at alleviating poverty to farmers even to a little extent by means of small scale horticultural development.

3.1.1 Structural Constraints

The socio-cultural constraints concerning community and local government administration are shown as follows, and the measures to counter them are included in this project as much as they would be adopted in a capacity building programme.

Constraints concerning community are;

hesitation at making new action (lack of positive attitude, traditional and social restriction),
distrust against local government administration,
ignorance of administrative services and a variety of supports,
insufficient means to access the administrative services, and
insufficient information concerning the administrative services.

Constraints concerning local government administration are;

insufficient budget,
delay of staff allocation,
improper and inadequate facilities,
incomplete comprehension of administrative targets,
spread of inefficient bureaucracy,
improper administrative functioning (inappropriate way of access to communities), and
insufficient capability for monitoring and evaluation.

3.1.2 Problems in Agriculture

The problem tree summarised below gives the essence of PCM workshop and the results of in-depth field surveys, farmers' interview surveys, PRA and so forth.

The general reasons of a low agricultural income are limited agricultural production, low prices of crops, high cost of farming, and poor performance of agricultural projects. Furthermore, region-specific reasons are identified as follows.

- Hot and humid climate that makes selection of suitable vegetable species difficult
- Low soil fertility except the areas along riverbanks that are seasonally flooded
- Sporadic vegetable production that does not allow keeping regular market business
- Occupation of markets by vegetables produced in the west high land area
- Small market demand causing high competition and low selling price
- Relatively high opportunities for alternative businesses

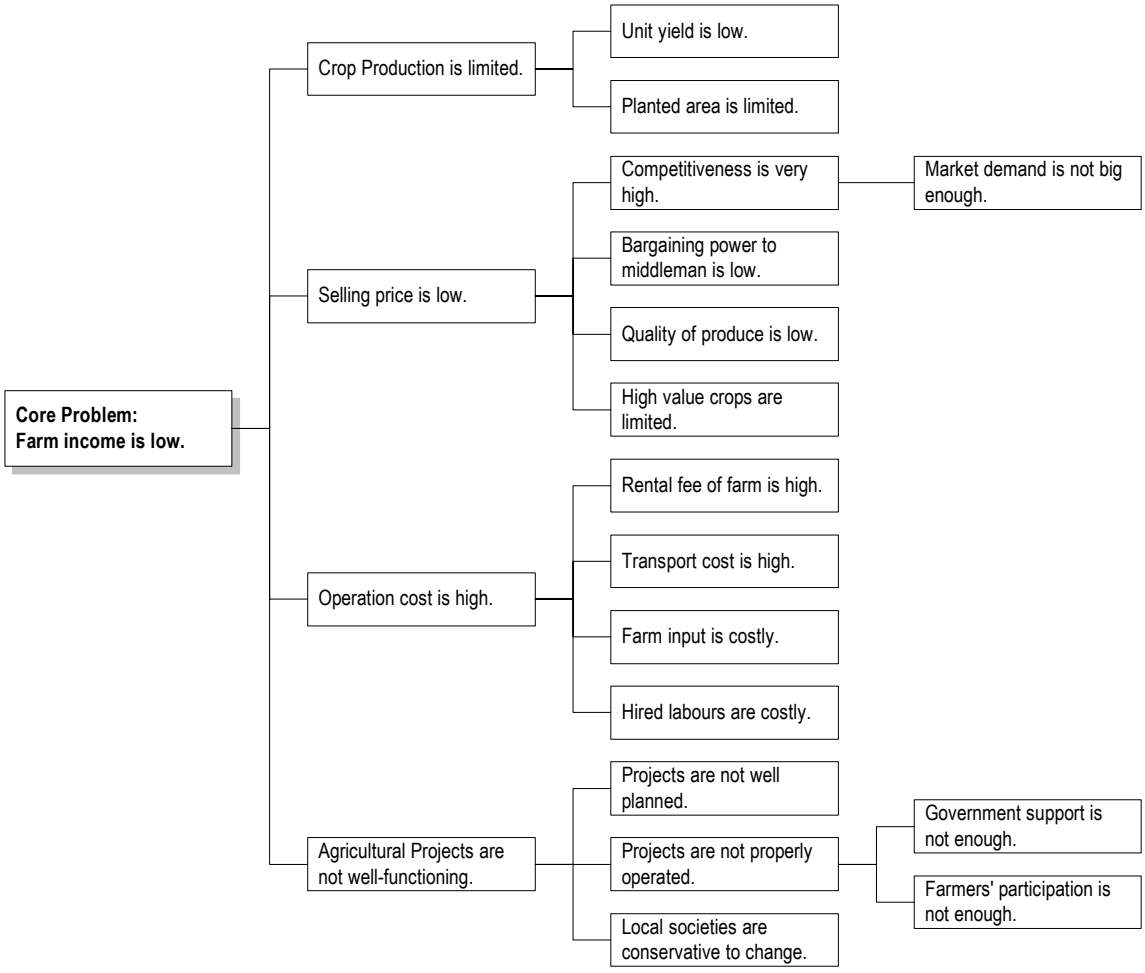

Fig. 3.1.1 Problem Tree

3.2 Development Potentials

After the study on "the zoning by farming system in horticulture" and "the land, water, labour and marketing conditions" was conducted, the development potentials of the study sites were assessed.

3.2.1 Zoning by Farming Systems in Horticulture

The farming systems are confirmed focusing on the vegetable and fruit crop production. Two types of vegetable production are recognised in the region. One is the high-input cultivation of vegetables in the limited area along the road. This area with easy access to market and water source can have an advantage in vegetable cultivation, even though the production costs are high due to low soil fertility and pest and disease control. The farmers in such area cultivate vegetables throughout the year using chemical fertiliser, organic manure and agro-chemicals.

The other is the low-input cultivation of vegetables in the plains along the Ruvu and Rufiji rivers. These vast river basins are used for food crop production during the rainy season. The farmers plant vegetables once a year starting just after the long rainy season. Most of the farmers in these areas do not use any chemical fertiliser, organic manure or agro-chemicals. The yield of tomatoes in the area, however, is usually higher than the high-input vegetable area, because of higher natural soil fertility as well as low occurrence of pest and disease damages.

Besides vegetable cultivation, the huge areas are used for fruit crop production. This is also a type of horticulture that is commonly practised in the Region. Food crops are produced between or under the fruit crops for home consumption or local market. Some kinds of vegetables are also planted in home garden.

Table 3.2.1 Zoning by Cropping System in Horticulture

Zone	Characteristics	Location	Divisions
1. High-input vegetable zone	Intensive cultivation with high farm input level for commercial purposes. Mono-cropping in a plot in limited place. Major vegetables are tomatoes, okras, eggplants and cucumbers. Selling the farm produce to local and central markets.	Scattered. Along road. Bottoms of small valleys. Densely populated areas.	Part of Mwambao (Bagamoyo) Kibaha, Part of Mlandizi (Kibaha)
2. Low-input vegetable zone	Food crops (paddy, maize, etc.) are mainly planted during the rainy season. Vegetables are usually grown as a secondary crop without fertiliser and chemicals. Main vegetables are tomatoes, pumpkins and okras.	Major river basins (Ruvu and Rufiji rivers). Fertile soils.	Part of Mwambao, Yombo (Bagamoyo) Part of Mlandizi, Ruvu (Kibaha) Mzenga (Kisarawe) Ikwiriri, Part of Mkongo (Rufiji)
3. Fruit crop zone	Kinds of fruit, cashew and coconut trees are planted as cash crops. Food crops like cassava are mainly cropped between tree crops. Homegarden-style vegetable cultivation is scarcely found. Amaranthus is a dominant leaf vegetable for local consumption.	Widely located in undulating land.	Miono, Kwaruhombo, Msata, Msoga (Bagamoyo) Sungwi, Maneromango, Cholesamvula (Kisarawe) Mkuranga, Mkamba, Kisiju, Shungubweni (Mkuranga) Kibiti, Kikale, Mbwera, Part of Mhoro (Rufiji) Kaskazini, Kusini (Mafia)
4. No horticulture zone	Little vegetable and fruit production is observed, mainly for home consumption.	Remote areas. Scarcely populated areas.	Part of Mkongo, Part of Mhoro (Rufiji)

Source: JICA Study Team

3.2.2 Vegetable Development

Based on the problem trees and zoning of horticulture, the potential and strategy of horticultural development were assessed. In this assessment, four conditions were taken into account, i.e., land, water, labour and marketing.

Judging from the conditions below, there are potentials associated with land conditions, but big constraints exist regarding water, labour conditions and marketing. Except the area along Morogoro highway, development potential for vegetables in the Region appears not so high. However, 1) to keep a consumption demand of vegetables large and 2) to make effort to expand the share of market in Dar es Salaam and other markets after improving quality of produce and keeping a sufficient quantity constantly, could give a higher possibility to horticultural development.

Land: There is ample room for vegetable development in the Region as the cultivated area devoted to vegetable production is still very small today.

Water: Vegetables are cultivated after paddy harvest using residual soil moisture or where there is water source in the dry season. As there are only few areas where farmers can get water

from ponds or groundwater, there is a constraint in obtaining water.

Labour: A labour shortage is observed in the Region due to the following reasons. Average labour force per farmhouse counts only two persons. Women, who play important roles in agriculture here, have many other domestic jobs and have a little time left to devote to agriculture. Landless workers tend to go to Dar es Salaam to find other jobs.

Marketing: High land regions and other areas hold the monopoly for non-easily perishable produce such as onions, carrots and potatoes, leaving small rooms for the Region. Also, farmers in the Region have to compete with farmers in Dar es Salaam regarding perishable and leafy vegetables. With these considerations in mind, one can say that there are big constraints in marketing.

3.2.3 Fruit Development

It can be said that to build a collecting and shipping system of fruit with quality and quantity control should contribute to their development, as a similar assessment for vegetable development potential.

Land: There is plenty of land suited for fruit development.

Water: Fruit is normally cultivated in rainfed conditions and precipitation in the Region is sufficient enough for fruit cultivation.

Labour: Labour conditions are almost as same as that of vegetable development. However, as fruit does not need much labour for day-to-day crop management such as watering, labour conditions may be better than for vegetables.

Marketing: The Region has an advantage of fruit development as it holds a certain share already in the fruit market located in the vicinity of Dar es Salaam. In future, even export may be possible if quality is properly controlled and sufficient quantity is produced.

3.3 Development Concept

Judging from the results of the field studies, an abrupt leap with development cannot be expected. Thus, a practical direction for development is sought. For this purpose, three development concepts are emphasised, i.e., profit-oriented development, bottom-up development, and vertical development. These concepts aim at improving farmers' income. In addition, solving the problems of structural poverty that is described as the lack of access to the necessary information and services is also included in the concept of this Programme since it is also a main factor in poverty alleviation.

3.3.1 Profit-oriented Development

In the programme, priority is given to the profit-oriented approaches, which directly break the vicious cycle of the problem tree. First of all, farmers are to be empowered by increasing thier income through the community based horticultural development, i.e., the Project. Empowerment of farmers, thus initiated, directs them to further initiatives to improve their living conditions. Supported by the Government, donors and NGOs, farmers are encouraged to proceed to the next development activities. The efforts of the communities are expected to continue for the improvement of the "quality of life" along the cycle as illustrated below.

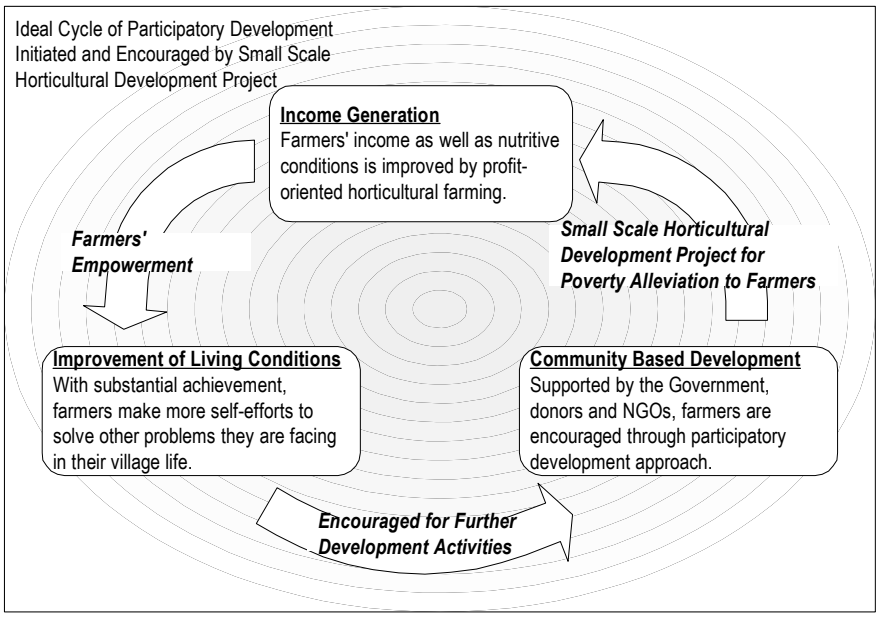

Fig. 3.3.1 Profit-oriented Development Concept

3.3.2 Bottom-up Development

In principle, the Project is planned to be implemented by initiatives and self-efforts of farmers. This is why the "bottom up approach" is the most appropriate for community based development. The Government is to support such farmers' efforts through infrastructure development, which is too costly to realise solely by farmers' own financial resources. The project sustainability is dependent not only upon farmers' empowerment (capability to solve the problems facing them) but also upon the logistic supports and other services. Capacity building for both the Government and community is another essential input to enhance the project sustainability.

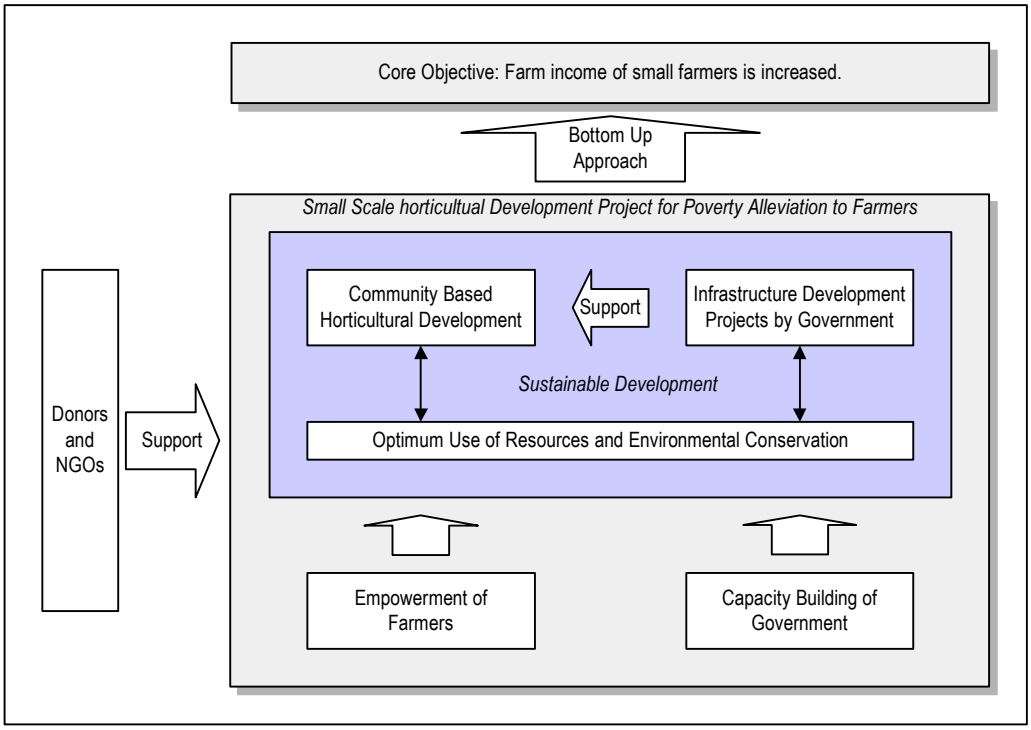

Fig. 3.3.2 Bottom-up Development Concept

3.3.3 Vertical Development

The constraints in horticultural development are represented by unforeseeable market prospect compared to the secured market of staple crops such as rice and maize. Because of perishable nature of crops, farmers always take a risk in marketing and price fluctuation. Under such circumstances, abrupt expansion of horticultural crops is not recommended. The Project shall be formulated upon the concept of "vertical development" rather than "horizontal development". The horizontal development is a concept based on expanding cropping area to increase production, which requires land reclamation works. On the other hand, the vertical development is a concept based on improving quality and unit yield of crops to increase production and value-added, and needs more technical knowledge, labour and farming input.

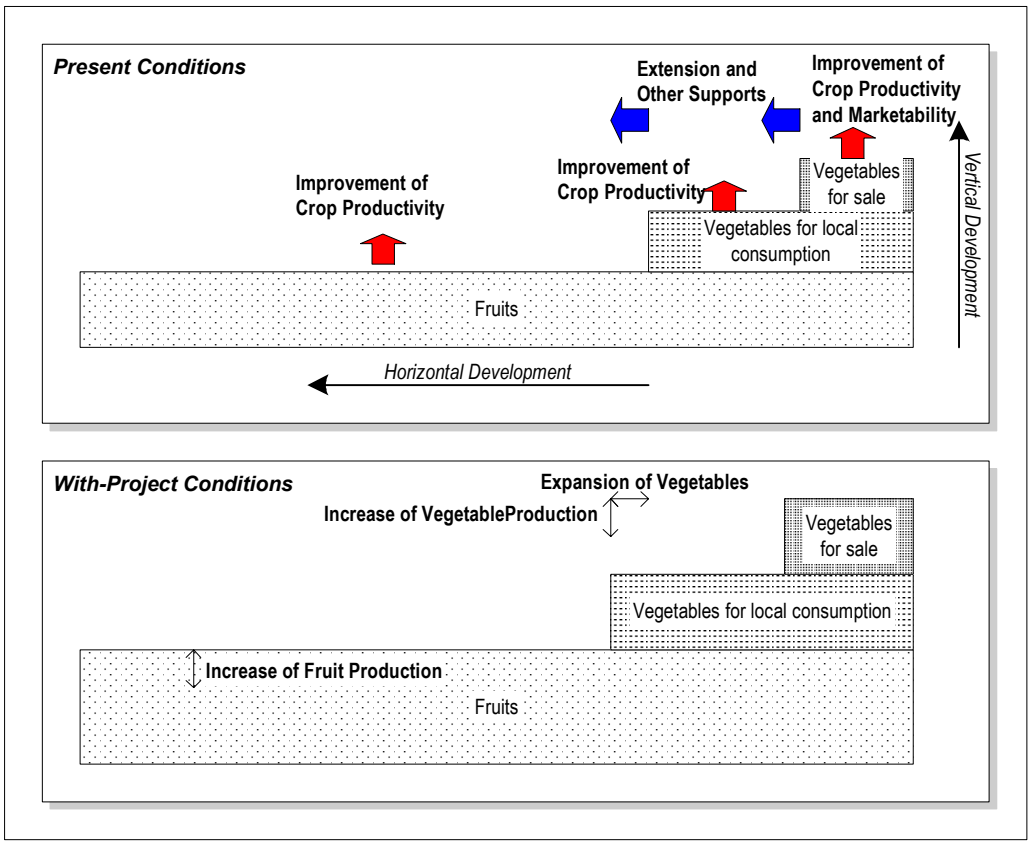

Fig. 3.3.3 Vertical Development Concept

3.3.4 Structural Poverty

In the Study, poverty is referred to as "structural poverty" as well as "income poverty". Structural poverty means that people live in a situation of limited chance or a situation shut out from the possible opportunities, while income poverty simply means economic difficulties. Income alone cannot always show the standard of poverty.

The situation of poverty in the Study area is that the farmers cannot have a chance or have only a limited chance to access social services. The limited chance arises from two constraints; one is that the farmers have difficulties to access the existing services of the Government and the other is that the Government does not extend the services effectively. Under such circumstances, both sides need capacity building. Through the capacity building, the farmers are to be able to access the services of government, and the Government are to be empowered to provide the services effectively.

This project is based on farmers' participation, in which a suitable access to the social services and supporting staffs is essential. In Tanzania, the Government prepares some administrative services, even if not sufficiently, and there is a lot of assistance from NGO and other donor organisations. It is very difficult to achieve development without any involvement of the above-mentioned NGO and

other donor organisations. If the cause of structural poverty is that people cannot access the organisation, improvement of the situation must be given the first priority. The Study also regards this as a part of capacity building.

3.4 Development Strategy

3.4.1 Development Strategy of Horticulture

(1) General Strategy

Basic development strategies of small-scale horticulture are thus established in consideration of horticultural zoning, development constraints and potentials. These strategies are applied to their objective horticultural zones, and their applicability is shown below.

Table 3.4.1 Applicability of Development Strategies of Horticulture by Horticultural Zone

Development Strategies	High-input vegetable zone	Low-input vegetable zone	Fruit crop zone	No horticultural zone
(a) Improvement of profitability of horticultural crops	Applicable	Applicable	Applicable	Not Applicable
(b) Expansion of off-season vegetable production	Applicable	Partly Applicable	Partly Applicable	Not Applicable
(c) Diversification of varieties and crops	Applicable	Applicable	Partly Applicable	Not Applicable
(d) Improvement of farming practices	Applicable	Applicable	Applicable	Not Applicable

(a) Improvement of Profitability of Horticultural Crops (Quantity and Quality)

The main direction to increase horticultural crop production is not the expansion of the cropped area but the improvement of yields of vegetables and fruit crops. Higher yields of the crops may directly contribute to farm income generation, as long as market prices of the produce do not significantly fall. Improvement of quality of vegetables brings about higher prices in trading. Especially in the high-input vegetable zone, therefore, the farmers should adopt more advanced and intensive farming practices in the vegetable production, such as use of certified seeds, proper spacing, fertiliser and chemicals, crop management, watering and post-harvest processing.

(b) Expansion of Off-season Vegetable Production

The dominant cropping calendar of vegetables, in which common vegetables are sowed in June and then harvested in September, is very economical especially as much as watering is concerned, but the produce is to be sold at the very low prices due to oversupply. Shifting of harvesting time from July-September to the late dry season or rainy season brings about much higher market prices during the off-season. Therefore, the off-season vegetable cultivation should be encouraged in the suitable areas with some reliable water sources. The farmland where water source is not sufficient or not

economical cultivation of off-season crops is not recommended because of much risk of losing high investment.

(c) Diversification of Crops and Varieties

Introduction of new kinds of vegetables should be considered to substitute the inter-regional import of crops, such as onion, carrot and cabbage, and to export to Dar es Salaam high value crops such as sweet melon. In addition, some vegetable and fruit varieties suitable for variable local conditions should be selected based on such characteristics as drought tolerance, pest and disease resistance, high yielding and high quality, and then be planted in the smallholder farmers' fields.

(d) Improvement of Farming Practices

The present local farming practices from land preparation to marketing have lots of room to be improved towards lifting up farm profitability. For example, certified seeds or seedlings should be used more frequently in all horticultural farmland in place of self-production seeds/seedlings. The old trees in orchards should be replanted due to low productivity and poor quality. More manufactured fertiliser and chemicals should be applied to high-value vegetable production by the commercial horticulturists. In most farmland, the use of organic manure, especially animal drops should be increased, although that requires the promotion of the mixed agricultural system involving crop growing and animal husbandry in the Region. The improvement of watering methods should be reconsidered from the technical and financial aspects because it can significantly reduce labour input in vegetable production. The harvesting, processing and transport of the horticultural crops should be improved for the purpose of better trading conditions.

(2) Development Strategy by Farming System

The high input vegetable zone, which has better access to the markets, needs the financial and technical support of the government in order to promote further development of commercial vegetable production. Input credit is an effective measure to achieve this goal. The farmers in this zone are enforced to practise high input production of vegetables, because of low soil fertility and inappropriate land applicability. To minimise the risks on the market price, crop diversification is also recommended. The district extension services should be strengthened through capacity building.

The low input vegetable zone, which lies on the river plains, is blessed with higher soil fertility and land availability. The farmers in this zone can enjoy favourable natural conditions for vegetable production so far. To sustain such productivity, the farmers should apply organic manure and appropriate crop rotation. The crop diversification is recommended to minimise the risks of low production and low market prices. The modern farming methods should be introduced here gradually through district extension services.

The fruit crop zone, which spreads over the Region, needs technical improvement in fruit production. The fruit trees with low productivity or low quality should be replaced with certified seedlings introduced through district seedling farms. The proper orchard management including pruning and weed control is strongly recommended to be practised to improve productivity and quality of marketable produce.

3.4.2 Improvement Measures for Marketing of Horticultural Crops

In order to promote horticultural production and mitigate poverty for farmers in the Region, a market development plan shall be established taking the aforementioned marketing situations into account. The development plan is divided into both a short-term and long-term one.

The short-term development plan consists of the following two categories. One category dealing with a measure associated with production is to promote selected crops with less marketing and pricing problems. At present, the high potential crops in the Region are cashew nut, a traditional export crop, and some indispensable vegetables that are imported from other regions.

The other category deals with measures regarding farmers and middlemen as well as the agencies concerned. Although these measures are difficult to implement, they should be introduced as early as possible. The proposed measures regarding farmers and middlemen will allow the farmers to minimise their production cost as low as possible, to sell their produce by themselves at some nearby places, to sell their produce directly to public markets in Dar es Salaam, to standardise horticultural produce, to promote joint use of transport facilities, to improve existing poor collection points, and to establish direct sell depots of horticultural produce. The measures regarding the agencies concerned aim to improve the agricultural marketing information system, including the basic marketing information in major public markets in Tanzania by the Ministry of Agriculture and Food Security, along with the existing public markets, and to expand farmers' direct selling space by district governments.

The long-term development plan is formulated based on the hypothesis that the horticultural production will be considerably increased through the implementation of the above short-term plan. As for vegetables, when the production in villages reaches a full development stage, the farmers engaging in it for sale shall examine the possibility of mass shipping by bringing the produced crops together through a farmers' organisation as well as utilising the official market agent. As for fruits, the Region shall develop local specialities through stringent specifications, which include variety and other characteristics constituting the desired quality demanded by extremely discriminating consumers, strengthening storage and packing facilities as well as standardisation, in order to compete successfully with other producing areas. Furthermore, Tanzania shall encourage exporting fruit to the neighbouring countries, Middle East and Europe in order to overcome the constraint of the narrow

domestic horticultural market.

As an additional long-term measure by other agencies, the existing cashew nut factory located in Kibaha district shall be rehabilitated with private sector participation with the increment of cashew nut production. Also the Government should examine possibility of new agricultural wholesale market equipped with more modern facilities as well as marketing systems.

3.4.3 Development Strategy of Related Infrastructure

(1) Irrigation and Drainage Development

(a) Irrigation

Taking into consideration the findings of the field surveys and the physical and socio-economic development constraints of the Study area, basic directions of irrigation promotion of the Project have been established as follows.

- The irrigation method of "Watering", which is a practice applied in the whole Study area, is recommended to be improved in line with the small horticultural unit covering from 0.2 - 0.5 acres, and its suitability of scattered watering. Surface irrigation methods for food crops such as border, furrow and basin irrigation are not recommended in the Master Programme in principle from the viewpoint of water saving.
- Much modernised irrigation facilities and equipment, which involve high investment and special care for operation and maintenance, are not proposed in the Master Programme. Provided that the present level of labour force is maintained, methods for improving the present practices to increase yields within the limit of such labour force level are searched.
- Water impounding and shallow wells are the most probable types of water sources to be developed. However, careful consideration shall be taken with regard to the availability of finance and the possibility of good maintenance when new construction of water sources is intended. The strategy for irrigation water source development is to utilise water sources within their possible limits. These limits will be improved as long as an expansion of the availability of water is possible without involving an excessive improvement cost.
- In the area that holds less possibility and poor feasibility to develop more irrigation water source rather than presently used, it is recommended to search an agricultural development direction with limited supplementary irrigation.

In line with the irrigation development directions mentioned above, improvement measures by horticultural zones are proposed as follows.

Table 3.4.2 Basic Measures in Irrigation Development

Zone	Present Condition	Plan
High input vegetable zone*	Water Source: Ponds, Wells, Stream flow Irrigation Method: Watering by hand Irrigation Facilities: Partly installed hose	Water Source: Improved ponds, improved wells* Irrigation Method: Watering by hand Irrigation Facilities: Removable pumps, installed hose
Low input vegetable zone**	Water Source: Ponds, Shallow wells (seasonal) Irrigation Method: Watering by hand Irrigation Facilities: No facilities	Water Source: Improved ponds, shallow wells * Irrigation Method: Watering by hand Irrigation Facilities: No facilities
Fruit crop zone***	Water Source: Rain water Irrigation Method: Not applicable Irrigation Facilities: No facilities	Water Source: Water harvesting tank, Shallow pits*** Irrigation Method: Watering by hand if necessary Irrigation Facilities: No facilities

*: Farmland categorised into High-input vegetable zone holds water sources with sufficient quantity of water. The present water sources of ponds and/or wells will be improved so as to make water fetching easier, and to secure irrigation for vegetables over the full cultivating period.

**: Farmland categorised into Low-input vegetable zone holds water sources at best enough to cultivate vegetables by September. The present water sources of ponds and/or wells will be improved so as to make water fetching easier, and to slightly enlarge cultivating period of vegetables.

***: Farmland categorised into Fruit crop zone holds no water sources available for irrigation. While vertical development of Fruit crop zone will aim to develop tree crops cultivation without irrigation, spare water sources could be installed for providing multipurpose water where water exploitation is possible.

(b) Drainage

There is no serious drainage problem in upland fields except some drainage hazard areas in the flood plains along the big rivers. Therefore, the drainage plan in the Master Programme proposes minor improvement only such as adjusting the direction of the field ridges so as to line them up along contour lines.

(2) Roads

Major roads classified into trunk roads and regional roads are not considered in the development plan of the Master Programme, because those are to be dealt with by the Tanzania Government. Minor improvement of district roads and feeder roads is included in the Master Programme as far as the present conditions of these roads obviously limit horticultural development.

The proposed works in the annual improvement plan above do not cover all actual required tasks but ones decreased so as to be within the allowable budget as mentioned in the remarks. No donors' cooperation for fulfilling the rural road improvement plan has emerged so far. Therefore, the only financial sources available are the Road Tool Fund and their own budget. Under such financial circumstances, allowable budget for routine maintenance of rural roads appears to be less than 20% of the total amount required for all tasks.

In order to keep the rural roads suitable conditions, beneficiaries' participation in road maintenance is indispensable. Additionally, major rehabilitation works and new construction of rural roads shall be assisted by the very positive involvement of NGOs and external donors under an agricultural/rural development sector programme, thus saving the limited district budget for the routine road maintenance works. Moreover, the remaining maintenance works put off for future years shall be

supported by beneficiaries' participation. Capacity building of district officers concerned is required for the success of such practice.

(3) Domestic Water Supply

Any new schemes focussing on only domestic water supply improvement, either covering some individual farmers or certain farmers groups, are not proposed in the Master Programme, as its main objective is to promote horticultural development. In the case that new water sources have to be developed to accommodate for irrigation, it may be appropriate to consider domestic water supply. Some instances of water supply improvement within the community-based horticulture development are examined for the priority sites. Farmers' involvement could be expected at the beginning stage of water supply development. It is considered that the essential problem related to water supply in the Study area is a lack of reliable water sources. Thus, enlightening easy methods of water harvesting that can be practised by each farmer without big investment is focused. The water harvesting is a method to collect rainwater directly from the roof and to store the water in the water tank.

3.5 Framework of the Master Programme

3.5.1 Development Approaches

Attempts have been made for identifying the best-suited development approaches on the objective tree that was developed from the problem tree. The development approaches, which are shown below, not only describe needs for the horticultural development but also guide courses to be taken to solve the problems, and the programmes are then made through sorting out and combining the courses suggested. Social infrastructure such as hospitals and schools is also included in the villagers' needs, but they are not included in the Master Programme as they are beyond the frame of this Project. The programmes are described as aggregate of sub-programmes and tools that are defined as the concrete development means to achieve certain goals and are included in the programmes.

1) Agricultural Extension Service Reinforcement Approach
2) Watering Method Improvement Approach
3) Horticulture Farming Technique Improvement Approach
4) Community Development and Leaders Training Approach
5) Farm Inputs Procurement Approach
6) Crop Diversification Approach
7) Rural Roads Improvement Approach
8) Capacity Building of District Offices and Officers Approach
9) Farmers Training and Education Approach

3.5.2 Formation of the Master Programme

Four programmes are formed; each of which consists of either one or several development approaches mentioned above. Development of site-specific farm management is focused on under the Master Programme, whereas strengthening farmers' capacity and improving relationship between farmers and local government are also targeted in order for horticultural development to be implemented effectively.

I. Community Based Horticultural Development Programme:
This programme is to support targeted farmers both financially and technically. A development tool used on financial aspect is input credit under which farmers can borrow agricultural input such as seeds, fertiliser, pesticide, sprayer and so forth, on the other hand, watering, crop protection, quality control, crop diversification and soil management are tools on technical aspect.

II. Participatory Development Capacity Building Programme:
For horticultural development, improvement of agriculture itself alone is not enough. Farmers should be adequately trained and institutions concerned are to be strengthened. This is the purpose of this programme, which consists of three parts as follows:
Part 1 Training for District & Extension Officers
Part 2 Training for Group Leaders
Part 3 Community Awareness Creation

III. District Seedling Farm Programme:
Certified seedling is produced and distributed under this programme. Introduction of new varieties of vegetable is examined as well. This programme supports Programme I in regard to farming technology.

IV. Rural Transport Improvement Programme:
Transport means is included and improved. This programme is inevitable for proceeding efficient implementation of Programme I, II and III.

The relationship between each development approach and each programme is shown in the diagram below.

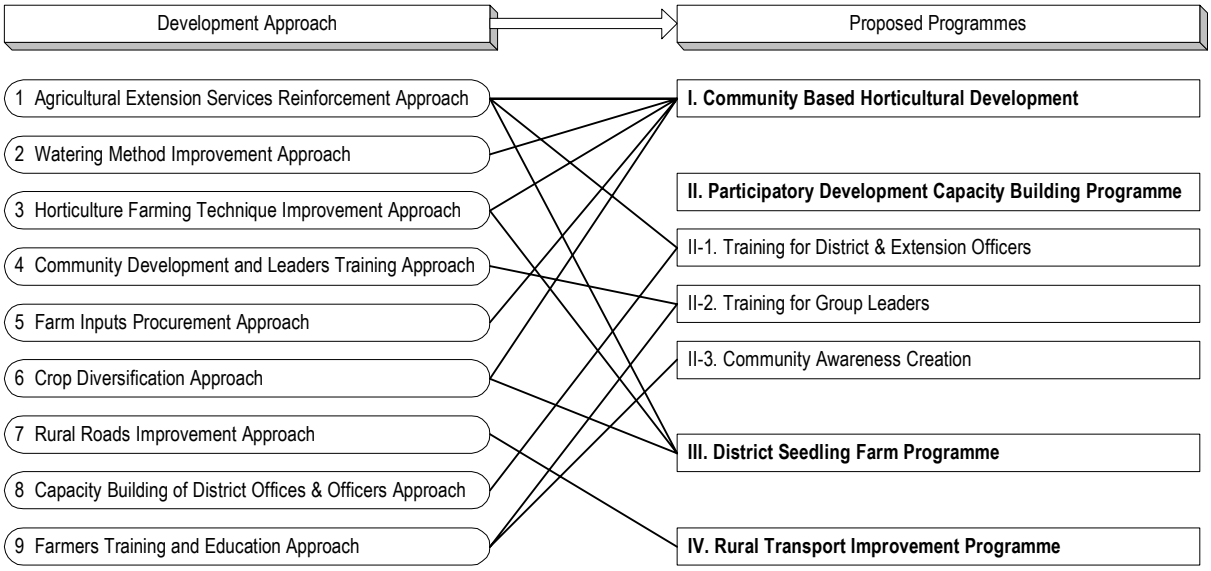

Fig. 3.5.1 Relationship of Development Approach and Programme

The relationship among the proposed programmes is illustrated in the following figure. Community based horticultural development programme would be supported by district seedling farm programme and rural transport improvement programme. These programmes would be sustained by participatory development capacity building programme.

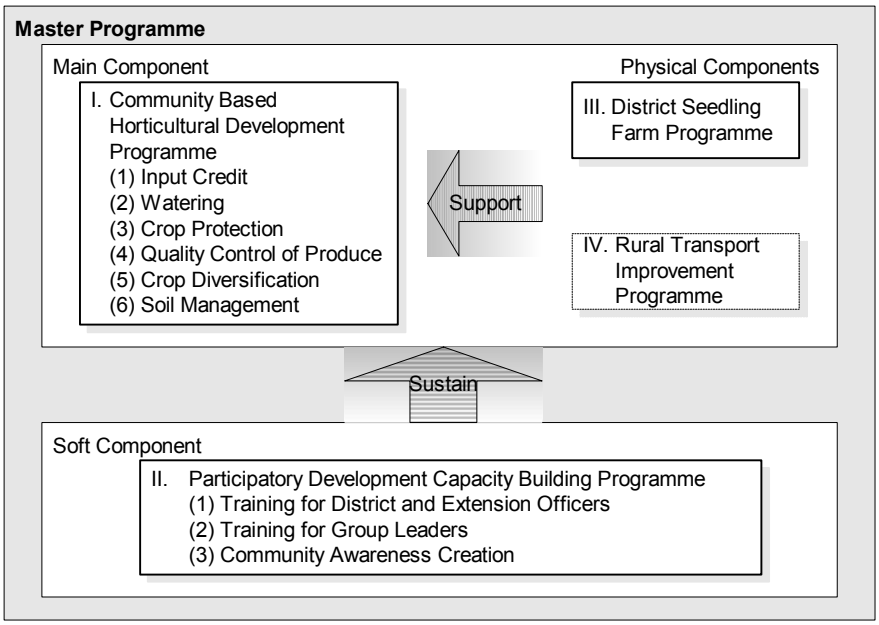

Fig. 3.5.2 Relationship among Projects under the Master Programme

3.6 Framework of the Action Plan

Priority sites for development were selected in the Master Programme. The Action Plan consists of concrete development plans of each priority site. This Plan has many development project menus. This menu is useful even if it is implemented alone, however, if several menus are combined, they become a small but integrated agricultural development project and obtain a multiplier effect.

3.6.1 Selection of Priority Sites

The action plan was prepared for the priority sites, as an in-depth implementation plan for site-specific components of the master programme. As the master programme is to be realised from selected programmes under site conditions and people's needs, the unit for the action plan was set as a village or a sub-village with certain uniformity.

The priority sites were selected as pilot models for small-scale horticultural development in the Region. The pilot model should be an example for easier success of the development, which has its own characteristics in a given horticultural zoning; namely high input vegetable zone, low input vegetable zone, or fruit zone. The selection process was, at first, to assess potential on horticultural development of each divisions by population density, road density, distance from Dar es Salaam and extension services. Then, the typical villages within the high potential divisions were selected as the priority sites, consulting with district agriculture offices. Eventually four villages or sub-villages were selected three horticultural zone, as follows.

- High Input Vegetable Zone: Viziwaziwa village
- Low Input Vegetable Zone: Mwanabwito village
- Fruit Zone: Vigama sub-village, Mwanambaya village

3.6.2 Action Plans in the Priority Sites

The Action Plans for the priority sites were formulated in consideration of the study results on site conditions, farming style, constraints and potential, as well as the PRA results on people's awareness and intention. The Action Plans made in 2000 are described in the following tables, in which the underlined procedures are realised in the Verification Study.

Table 3.6.1 Action Plan for Horticultural Development in Viziwaziwa

Sector	Item	Plan	Target	Method	Procedure	Period
Agricultural Development	Vegetable Development	Yield Improvement	To increase unit yield rate of vegetables.	To strengthen farm input supply to smallholders. To provide guidance on varieties and farm management to smallholders.	To introduce input credit to the farmers' groups. To strengthen extension services through capacity building programme.	5 years
		Quality Improvement	To improve quality of marketable vegetables.	To strengthen farm input supply to smallholders. To provide guidance on varieties, farm management and grading to smallholders.	To introduce input credit to the farmers' groups. To strengthen extension services through capacity building programme.	5 years
		Season Diversification	To increase rainy season cropping and early dry season cropping.	To provide guidance on pest and disease control in the rainy season. To develop water source in the early dry season.	To conduct crop management test and demonstration at experimental farms. To strengthen extension services through capacity building programme.	4 years
		Crop Diversification	To reduce risk on low yield and prices of vegetables. To save farmers' expenditure to imported vegetables.	To introduce new kinds or new varieties of vegetables through present extension channel.	To conduct crop adaptability tests at experimental farms. To strengthen extension services through capacity building programme.	4 years
		Strengthening on Watering Practice	To increase at 10% of cropped area, and extend cultivating term at one month.	To reform and excavate Kisimas, and improve water use availability of pond.	To be assessed the methods by the Verification Study. To be realised through self-reliance of farmers.	5 years
		Proper Use of Agro-chemicals	To prevent misuse and overuse of agro-chemicals.	To enforce proper use of agro-chemicals through extension channel.	To strengthen extension services through capacity building programme.	5 years
		Strengthening on Marketing	To endow the smallholders with bargaining power.	To support to organising groups. To provide market information.	To install marketing facilities including storage, grading space and container.	Future Prospect
	Fruit Development	Introduction of Advanced Seedlings	To replace old trees by advanced seedlings.	To introduce certified seedlings from Sokoine University.	To provide certified seedlings in District Seedling Farm Project.	4 years
		Proper Orchard Management	To enforce proper orchard management for improvement of products and pest and disease control.	To disseminate orchard management practices such as pruning, slashing and pest and disease control.	To demonstrate proper orchard management at District Seedling Farms. To strengthen extension services through capacity building programme.	4 years
		Strengthening on Marketing	To trade products at a reasonable price.	To provide guidance on standard of grading to smallholders.	To strengthen extension services through capacity building programme.	3 years
Social Infrastructure Improvement	Transport Infrastructure	Rural Road Rehabilitation	To rehabilitate rural road of Route (B) (Mwendapole – Viziwaziwa)	-	To prepare rehabilitation plan in the Master Programme. To improve access to government and donors (Guideline).	2 years
	Transort Means	Introduction of New Transport Means	To advance present transport by hand or bicycle.	To introduce new cart/trolley.	To assess and demonstrate suitable transport means.	5 years
	Community Activities	Necessary Assembly of Villagers	To provide room for community assembly.	To substitute school building, or construct new assembly hall.	To prepare construction plan of the hall in the Master Programme. To assess its usage through the Verification Study.	4.5 years

Table 3.6.2 Action Plan for Horticultural Development in Mwanabwito

Sector	Item	Plan	Target	Method	Procedure	Period
Agricultural Development	Vegetable Development	Yield Improvement	To increase unit yield rate of vegetables.	To provide guidance on varieties and farm management (organic manure use, etc.) to smallholders. To strengthen farm input supply to smallholders.	To strengthen extension services through capacity building programme. To introduce input credit to the farmers' groups.	5 years
		Quality Improvement	To improve quality of marketable vegetables.	To provide guidance on varieties, farm management and grading to smallholders. To strengthen farm input supply to smallholders.	To strengthen extension services through capacity building programme. To introduce input credit to the farmers' groups.	5 years
Agricultural Development	Vegetable Development	Crop Diversification	To reduce risk on low yield and prices of vegetables. To save farmers' expenditure to imported vegetables.	To introduce new kinds or new varieties of vegetables.	To conduct crop adaptability test at experimental farms. To strengthen extension services through capacity building programme.	4 years
		Strengthening of Watering Practice	To increase at 10% of cropped area.	To improve water use availability of pond.	To prepare improvement plan and assess the methods by the Verification Study. To be realised through self-reliance of farmers.	5 years
		Strengthening on Marketing	To endow the smallholders with bargaining power.	To support to organising groups. To provide market information.	To install marketing facilities including storage, grading space and container.	Future Prospect
		Proper Use of Agro-chemicals	To prevent misuse and overuse of agro-chemicals.	To enforce proper use of agro-chemicals through present extension channel.	To strengthen extension services through capacity building programme.	5 years
	Fruit Development	Introduction of Advanced Seedlings	To replace old trees with advanced seedlings.	To introduce certified seedlings from Sokoine University.	To provide certified seedlings in District Seedling Farm Project.	4 years
		Proper Orchard Management	To enforce proper orchard management for improvement of products and pest and disease control.	To disseminate orchard management practices such as pruning, slashing and pest and disease control.	To demonstrate proper orchard management at District Seedling Farms. To strengthen extension services through capacity building programme.	4 years
		Strengthening on Marketing	To trade products at a reasonable price.	To provide guidance on standard of grading to smallholders.	To strengthen extension services through capacity building programme.	3 years
Social Infrastructure Improvement	Transport Infrastructure	Rural Road Rehabilitation	To rehabilitate rural road of Route (A) (Kikongo – Mwanabwito)	-	To prepare rehabilitation plan in the Master Programme. To improve access to government, NGO and donors (Guideline).	2 years
	Transport Means	Introduction of New Transport Means	To advance present transport by hand or bicycle.	To introduce new cart/trolley.	To assess and demonstrate suitable transport means.	5 years

Table 3.6.3 Action Plan for Horticultural Development in Vigama

Sector	Item	Plan	Target	Method	Procedure	Period
Agricultural Development	Vegetable Development	Yield Improvement	To increase unit yield rate of vegetables.	To use certified seeds and (organic) fertiliser, reduce water stress and practice pest and disease control. To provide technical guidance to smallholders.	To strengthen extension services through capacity building programme.	4.5 years
		Expansion of Cropped Area	To expand area for vegetable cropping to increase its production.	To provide technical guidance to smallholders.	To strengthen extension services through capacity building programme.	4.5 years
		Provision of Supplemental Water for Cultivation	-	To install water harvesting bunds.	To be assessed the methods by the Verification Study. To be realised through self-reliance of farmers (Guideline).	4 years
	Fruit Development	Introduction of Advanced Seedlings	To replace old trees with advanced seedlings.	To introduce certified seedlings from Sokoine University.	To provide certified seedlings produced at District Seedling Farm or farmers' group in the area.	4 years
		Proper Orchard Management	To enforce proper orchard management for improvement of products and pest and disease control.	To disseminate orchard management practices such as pruning, slashing and pest and disease control.	To demonstrate proper orchard management at District Seedling Farms. To strengthen extension services through capacity building programme.	4 years
		Strengthening on Marketing	To endow the smallholders with bargaining power.	To support to organizing groups. To provide market information.	To strengthen extension services through capacity building programme.	3 years
Social Infrastructure Improvement	Transport Means	Introduction of New Transport Means	To advance present transport by hand or bicycle.	To introduce new cart/trolley.	To assess and demonstrate suitable transport means.	5 years
	Community Activities	Necessary Assembly of Villagers	To provide room for community assembly.	To construct new community hall.	To prepare construction plan of the hall in the Master Programme. To assess its usage through the Verification Study.	4.5 years
Environmental Conservation	Soil and Water Conservation	Soil Erosion Control	-	To decrease erosion and soil lost and increasing land usability by simple measures.	To assess improvement method by Verification Study. To be realised through self-reliance of farmers (Guideline).	Future Prospect

Table 3.6.4 Action Plan for Horticultural Development in Mwanambaya

Sector	Item	Plan	Target	Method	Procedure	Period
Agricultural Development	Vegetable Development	Yield Improvement	To increase unit yield rate of vegetables.	To use certified seeds and (organic) fertiliser, reduce water stress and practice pest and disease control. To provide technical guidance to smallholders.	To strengthen extension services through capacity building programme.	4.5 years
		Expansion of Cropped Area	To expand area for vegetable cropping to increase its production.	To provide technical guidance to smallholders.	To strengthen extension services through capacity building programme.	4.5 years
		Provision of Supplemental Water for Cultivation	-	To install water harvesting bunds.	To be assessed the methods by the Verification Study. To be realised through self-reliance of farmers (Guideline).	4 years
	Fruit Development	Introduction of Advanced Seedlings	To replace old trees with advanced seedlings.	To introduce certified seedlings from Sokoine University.	To provide certified seedlings produced at District Seedling Farm or farmers' group in the area.	4 years
		Proper Orchard Management	To enforce proper orchard management for improvement of products and pest and disease control.	To disseminate orchard management practices such as pruning, slashing and pest and disease control.	To demonstrate proper orchard management at District Seedling Farms. To strengthen extension services through capacity building programme.	4 years
		Strengthening on Marketing	To endow the smallholders with bargaining power.	To support to organizing groups. To provide market information.	To strengthen extension services through capacity building programme.	3 years
Environmental Conservation	Soil and Water Conservation	Soil Erosion Control	-	To decrease erosion and soil lost and increasing land usability by simple measures.	To assess improvement method by Verification Study. To be realised through self-reliance of farmers (Guideline).	Future Prospect

Chapter 4 Verification Study

4.1 Process of the Verification Study

4.1.1 Basic Concept of Implementing the Verification Study

Most farmers in Coast Region live a self-sustaining life under very low income level. The reasons of poverty are lack of funds, lack of techniques, insufficient market systems and lack of social infrastructure such as roads, water supply system, sanitary facilities and education. All of these are very important for farming. Furthermore, the farmers are forced to be in a state of "structural poverty", which means that the people live in a situation of limited chance, a situation shut out from the possible opportunities. In other words, in case that the farmers try to get information or are eager to implement projects, they are blind to what kind of action they need to take.

In the Development Project, the four programmes shown in the following picture are proposed as the Master Programme designed to increase farmers' income and alleviate poverty by means of mitigating the above-mentioned state of structural poverty. The Verification Study was carried out in order to verify the efficiency and relevance of the Development Project (Master Programme and Action Plans), make the necessary amendment and propose projects suitable for the ability of the inhabitants in the study areas and the executing organisation. Consequently, it is necessary to properly grasp the relationship between the Development Project and the Verification Study as described below.

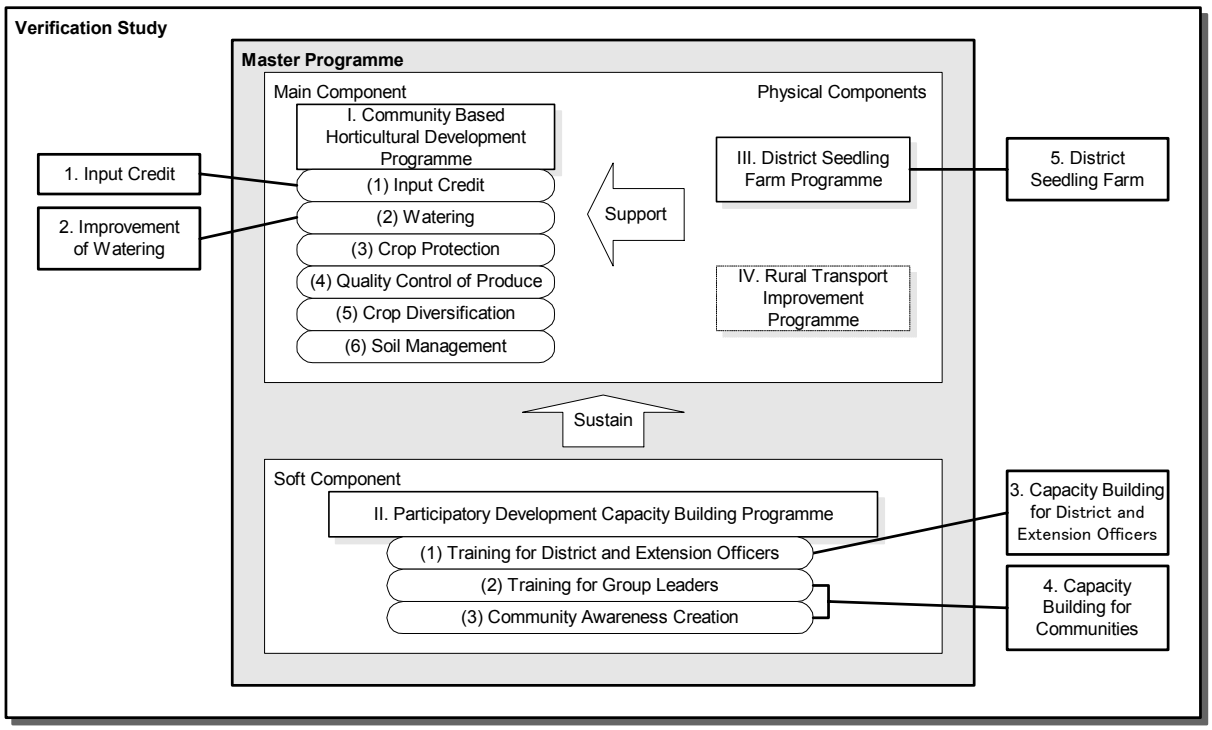

Fig. 4.1.1 Relationship with Master Programme and Verification Study

As basic concepts on implementing the Verification Study, five concepts were considered as follows.

1) Poverty alleviation is promoted by increasing the farmers' income through the horticultural development.
2) Participatory development is applied.
3) Structural poverty is improved increasing the project implementing ability of executing bodies.
4) Situation of the weak (women and youths) is strengthened.
5) Extension and expansion of horticultural development is promoted.

Among the above-mentioned concepts, the participatory development was stressed in the Development Project, however in the Verification Study, one went a step further and self-reliance was more emphasised. The real actors or owners of the micro projects were the rural inhabitants and the Team was their supporter. First of all, the inhabitants were made to think, then the administrative offices and the Team provided them with techniques, know-how and sometimes materials to make them act on the matters and started actions on the projects. The Team took the same standpoint against local government agencies. In this context, the Team gave ownership of the micro projects to them and expected sustainability of the projects, too.

Since the Verification Study aimed at the continuous development of each study item even after the completion of the Study, strengthening and capacity building of farmers' organisation and administrative offices were focussed on. Therefore, the Study was carried out using a participatory development approach, and the way to make the study items go well was researched. Monitoring and evaluation focused mainly on the extent of inhabitants' participation in the study items. As such, a system that could make the inhabitants and administrative offices manage the study items well was verified in the Study.

4.1.2 Micro Projects in the Verification Study

The Verification Study consisted of five micro projects and their sub projects, which are major parts of the Master Programme. The following table shows the items and the sites for the Verification Study.

Table 4.1.1 Micro Projects and Sites

Micro Project \ Study Site (District)	Viziwaziwa (Kibaha)	Mwendapole (Kibaha)	Kwa Mfipa (Kibaha)	Mwanabwito (Kibaha)	Ruvu Darajani (Bagamoyo)	Vigama (Kisarawe)	Mwanambaya (Mkuranga)	Mkuranga (Mkuranga)	Zegereni (Kibaha)
1. Input Credit	○	○	○	○					
2. Improvement of Watering	○ Pump			○ Pump	○ Pump				
3. Capacity Building for District and Extension Officers	○	○	○	○	○	○	○	○	
4. Capacity Building for Community	○ Leader Visit Shed Mill	○ Leader Visit	○ Leader Visit	○ Leader Visit Mill	○ Leader Visit Shed	○ Leader Visit Shed Mill	○ Leader Visit	○ Leader Visit	
5. District Seedling Farm	○ Plot			○ Plot		○ Group	○ Group	○ Group	○ Farm
Horticultural Zoning	*High Input Vegetable*			*Low Input Veg.*		*Fruit*			-

Remarks: Leader: Leaders' Training; Shed: Multipurpose Shed; Visit: Farmers' Training;
Plot: Experimental Plot; Group: Group Nursery; Farm: District Farm
Shed and Mill were carried out as concrete examples of the facilities described in the sub-programme "Promotion of Group Activities by means of Community Facilities" included in Participatory Development Capacity Building Programme in the Master Programme.

4.1.3 Implementing Organisation of the Verification Study

The projects implementing organisations was set up through the discussions held in the workshops and with the counterpart agencies. The main players of the Verification Study were as follows.

1) Farmers group; the smallest implementation organisation
2) Community Project Management Unit (CPMU); a group unit formed in a community to manage projects
3) District Project Management Committee (DPMC); a committee of CPMU members in one district
4) Joint Meeting of DPMC; a meeting of DPMC members covering the whole region
5) Steering Committee; a committee controlling all the activities of the V/S

The members of and relationship with each organisation are shown below.

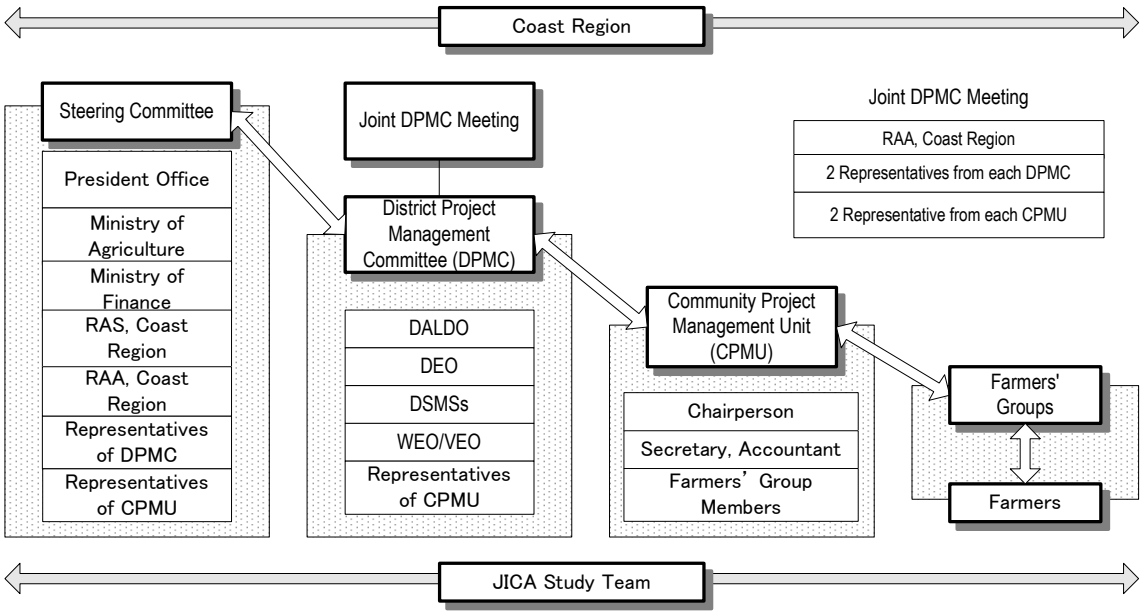

Fig. 4.1.2 Implementing Organisation of the Verification Study

4.1.4 Implementing Schedule of the Verification Study

The Verification Study (v/S) was conducted over a period of three years and three months from January 2001 to March 2004. In the first three months of 2001, the components and direction of V/S were decided, and then five micro projects of V/S was implemented from July 2001. Most of the input of the projects was provided and most of the activities were carried out as scheduled by the Tanzanian side and JICA until March 2002. In the Japanese fiscal year 2002 (April 2002 to March 2003), some input of Input Credit and District Seedling Farm was further provided and related activities were carried out. However the main works of V/S shifted to monitoring. In the Japanese fiscal year 2003 (April 2003 to March 2004), the main works included the monitoring as well, but the Tanzanian Side bore the main responsibility on the management of the projects.

In the course of the Study, a midterm evaluation was carried out in November 2002, and the way forward was reviewed. At the end of the study, a final evaluation was carried out in October 2003 by which important lessons were fed back to the Master Programme. The evaluations were carried out paying attention to the five criteria, which basic ideas are described as follows.

Efficiency: To what extent have "inputs" been converted to "outputs"?

Effectiveness: Whether the "project purpose" has been achieved, and how much contribution did "outputs" make?

Impact: What positive and negative effects has the implementation of the project had?

Relevance: Are the "project purposes" still consistent with the beneficiaries' needs and the policy of Tanzania?

Sustainability: To what extent will the recipient country's and farmers' organisations be able to retain the positive effects of the project after the withdrawal of cooperation?

4.2 Process and Evaluation: Input Credit

4.2.1 Project Design Matrix

The Project Design Matrix of Input Credit is shown in the Attachment. The following is a summary.

Overall Goal	* Other 4 districts in Coast Region start to support smooth management of Input Credit by CPMUs
Project Purpose	* Kibaha District is able to support smooth management of Input Credit by CPMUs
Output	1 Staff members of Kibaha DACOF (DAOF) and CPMUs acquire ability to carry out Input Credit 2 Input Credit gets a proper start 3 Kibaha DACOF (DAOF) starts to set up Input Credit Management Foundation
Activities	1 DACOF (DAOF) that is an execution organisation of Input Credit starts its implementation 1-1 Kibaha District establishes DACOF (DAOF) that is an execution organisation of Input Credit. 1-2 Staff members of DACOF (DAOF) receive training concerning management of Input Credit. 1-3 DACOF (DAOF) draws up details of implementation of Input Credit. 1-4 DACOF (DAOF) explains about Input Credit to CPMU members. 1-5 DACOF (DAOF) gives guidance on how to form groups to CPMU members. 2 Input Credit is implemented 2-1 Extension Officers receive training for Input Credit assistance. 2-2 Group leaders receive training concerning Input Credit. 2-3 CPMU members receive basic training concerning Input Credit. 2-4 Extension Officers give assistance to CPMU members concerning contents of Input Credit. 2-5 CPMU members apply Input Credit. 2-6 DACOF (DAOF) examines their applications. 2-7 DACOF (DAOF) purchases and delivers farm input. 2-8 Extension Officers give CPMU members proper guidance concerning full use of input. 2-9 DACOF (DAOF) assists the loanees in proper repayment. 3 Set-up of Input Credit Management Foundation Starts 3-1 DACOF (DAOF) maintains repayment properly for future revolving fund. 3-2 DACOF (DAOF) draws up plan of setting up Input Credit Management Foundation.
Input	[JICA] Personnel 1) Leader (1) 2) Expert: Credit (1) 3) Expert: Agronomist (1) Equipment 1) Computer (1) 2) Motor Cycle (3) 3) Balance (4) Farm Input 1) Seed、Fertiliser、Chemicals 2) Chemicals for emergency Running Cost 1) Fuel 2) Office Equipment 3) Training [Tanzania] Personnel 1) DACO (1) 2) ADACO (1) 3) DACT (1) 4) Messenger (1) 5) Extension Officers Facilities 1) Office Room 2) Electricity 3) Truck 4) Storage

PDM of Input Credit was reviewed on doing the final evaluation and was revised to some extent. The above PDM is the revised one. The items revised and the reasons are shown in the following table.

Table 4.2.1 List of the Items Revised and the Reasons

Items	Before Revision	Revised	Reason
Target Group	District Officers	District Officers and CPMU	Project Purpose was revised.
Overall Goal	1. Input Credit Organisation in Kibaha District transfers to cooperative	Deleted	Project Purpose was revised.
Indicators for Overall Goal	1. Organisation is restructured from DACOF to cooperative by 2008	Deleted	Overall Goal for it was deleted.
Project Purpose	Kibaha District is able to carry out smooth management of Input Credit	Kibaha District is able to support smooth management of Input Credit by CPMUs	As a result of 2 years implementation, it was found that the government body could not be an implementing organisation for credit. Therefore, CPMUs shall be the implementing organisations for the credit, and Kibaha District shall not be such organisation but supporting organisation for CPMUs.
Indicator for Project Purpose	1. Loaning rate to the initial fund invested become 100% by 2004 2. Budget for DACOF in 2004 is secured	More than 4 CPMUs starts Input Credit with the collaboration of DACOF (DAOF) by 2004	Project Purpose was revised.
Means of Verification for Project Purpose	1. DACOF monthly report 2. Hearing from District Officers	M/M of DPMC	Indicators for them were revised.
Important Assumption for Project Purpose	- Cooperative members acquire management know-how of Input Credit	Deleted	Project Purpose was changed.
Output	1. Staff members of Kibaha DACOF acquire ability to carry out Input Credit	1. Staff members of Kibaha DACOF (DAOF) and CPMUs acquire ability to carry out Input Credit	CPMU was added to the Target Group.
Indicators for Output	1. Clear auditing by the end of 2003 2. More than 45 groups require Input Credit at the end of 2003 3. Fund needed for establish Input Credit Management Foundation is secured by the end of 2003	1. More than 40 farmers starts cultivation with the Input Credit carried out by CPMUs at the end of 2003 2. More than 80% of repayment rate is achieved at the end of 2003 3. More than TShs 4,000,000 are secured by the end of 2003	Output was revised.
Means for Verification for Output	1. Auditing report 2. DACOF monthly report 3. DACOF monthly report	1. M/M of DPMC 2. DACOF (DAOF) bookkeeping documents 3. DACOF (DAOF) bank account	Indicators for them were revised.

4.2.2 Process of Inputs

Most of the input was properly committed, except motorcycle and computer, as they were delayed due to procurement problems. The input was effectively used.

4.2.3 Process of Activities

(1) Activity 1: DACOF (DAOF) that is an execution organisation of Input Credit starts its implementation

Activity 1-1: Kibaha District establishes DACOF (DAOF) that is an execution organisation of Input Credit

Kibaha District established a District Agricultural Credit Office (DACOF) that is an execution organisation of Input Credit in March 2001.

The District Agricultural Credit Officer (DACO), the Assistant District Agricultural Credit Officer (ADACO) and the District Agricultural Credit Treasurer (DACT) ran DACOF.

DACOF renovated DACOF office room in collaboration with the Team in August 2001, and the Team also provided DACOF with a set of computer and three motorcycles in November 2001.

DACOF completed the registration to Attorney General's Chambers as Board of Trustee to function as a non-profit making financial institution on the 1st of October 2001. Consequently, DACOF opened its bank account on the 19th of October 2001.

Activity 1-2: Staff members of DACOF (DAOF) receive training concerning management of Input Credit

The Team provided DACOF staff with the training described as follows, with the collaboration of Swissaid (NGO).

- First Step: 20th - 22nd August 2001
  Short course training on micro finance handling before implementation of Input Credit was conducted to RAA, DACO, ADACO, DACT and 5 VAEOs. (Details of the training are described in Annex X)

- Second Step: September 2001 – July 2003
  On the Job Training (OJT) for micro finance handling such as Preparation, Input Delivery, Repayment, Systemisation and Replication, has been conducted since September 2001 during implementation of Input Credit.
  Swissaid staff conducted a workshop to review general aspects of Input Credit after one year of its commencement on the 30th of September, and some orbital adjustment was made.

Activity 1-3: DACOF (DAOF) draws up details of implementation of Input Credit

DACOF reviewed and revised the original details of implementation of Input Credit drawn up in the Plan of Operation taking into consideration the guidance of Swissaid and compiled them into DACOF

Policy in October 2001. The conditions revised are shown in the following table.

Table 4.2.2 List of Conditions Revised

Items	Plan of Operation	First Step of the Training	Workshops	Reference Swissaid's Case
Interest	8%	8%	8%	10%
Membership Fee	not considered	TShs 1,000	TShs 1,000	TShs 2,500
Application Fee	TShs 1,000	TShs 1,000	TShs 1,000	2.5% of loan amount
Passbook Fee	not considered	TShs 1,000	TShs 1,000	1,500
Insurance Fee	not considered	0.50%	0.50%	0.50%
Savings	not considered	TShs 500/week	TShs 500/week	TShs 1,000/week
Emergency Savings	not considered	not considered	TShs 200/week	10% of loan amount
Punishment	not considered	8% of weekly repayment amount	8% of weekly repayment amount	10% of weekly repayment amount
Grace Period	4 months	3 months	100 days	-
Repayment Term	2 months	3 months	80 days	6 months
Repayment Interval	2 weeks	1 week	1 week	1 week

The midterm evaluation conducted in November 2002 revealed the Input Credit carried out in accordance with the abovementioned details of implementation had not functioned properly. Concerning the obstacles that hampered its smooth operation, the measures were discussed and the following procedure was decided to apply for the third credit distribution started in December 2002.

- District Agricultural Credit Office (DACOF) managed Input Credit from the beginning of Input Credit. On the other hand, Kibaha District Agricultural Office Registered Trustee (DAOF) was registered on the 1st October 2001 as a non-profit making financial institution. Even though DAOF was registered, DACOF continued its management. However, DAOF shall superintend Input Credit from the third credit to make clear legal basis.
- Input Credit shall be managed by CPMU aiming to create loanees' sense of duty for repayment and to make collection of loanees' individual data easy for adequate and sufficient screening of the loanees. It makes the system that the chooser (CPMU) of the loanees would suffer a loss caused by insufficient screening. Moreover, the running cost of Input Credit would be much smaller if CPMU manages instead of DAOF.
- DAOF who has knowledge to carry out credit shall focus on guiding, supervising and assisting CPMU. DAOF shall extend Input Credit project to other villages in the district using its knowledge.
- Training for CPMU to build capacity for managing Input Credit shall be carried out, and training for the loanees to create awareness of credit concept, especially credit is not a gift but is to be absolutely repaid and in case of arrears legal punishment would be imposed, shall be carried out.
- Instead of joint liability and savings for collateral that did not function well, collaterals or guarantors with collaterals shall be demanded.

- As a means of exaction, it shall be clearly described in the agreement that the legal action shall be applied in case of arrears.
- Screening of the loanees shall be carried out by CPMU. Assessment of loan amount and contents shall be also carried out by CPMU with the collaboration of DAOF, especially by VAEOs. Their results shall be reconfirmed through inquiry among village officers.
- Conditions of two years vegetable farming experience for eligibility shall be added.
- The input shall be delivered twice. Seeds, manure and a certain chemicals shall be delivered at the first time. DAOF delivers the remaining input at the second time after confirmation of the loanees to sow on the right farm.

Activity 1-4: DACOF (DAOF) explains about Input Credit to CPMU members

1) First Credit

In accordance with the Plan of Operation, DACOF gave the first credit only to farmers in Viziwaziwa village. Announcement of the explanatory meetings were done straight to the group members of Input Credit because the groups were already formed in February 2001. DACOF held the workshops to explain details of Input Credit several times at Viziwaziwa in early September 2001. The followings are the main items explained and discussed in the workshops.

- Importance of membership: necessity of introduction of membership fee to create awareness of ownership of the Association
- Importance of savings: necessity of introduction of savings to establish guarantee among group members and to save money for future use
- Necessity of passbook: purchase of passbook for recording savings and repayment
- Necessity of insurance: introduction of insurance against death and permanent physical disability occurred on loanees
- Punishment: 8% of repayment amount for failure of repayment
- Application fee: necessity of application fee for applying loan
- Emergency savings: necessity of emergency savings for emergency loan such as ceremonial occasions and even for paying arrears of Input Credit
- Grace period: 3 months for growing crops
- Repayment schedule: weekly repayment from the 8th January 2002 till the 2nd April 2002, 13 times
- Joint guarantee: guarantee against other members' debts by group members and no more loans in case of imperfect repayment as a group
- Flow of money: loanees - CPMU treasurer - DACOF bank account (only bank deposit slips go to DACOF)
- Group members: confirmation and identification of group members
- Registration: necessity of registration to the Ministry of Home Affairs and registration fee (for registration; TShs 40,000, annual fee; TShs 10,000)
- Storehouse: necessity of storehouse for agricultural input

2) Second Credit
In accordance with the Plan of Operation, DACOF gave the second credit to farmers in four villages of Viziwaziwa, Mwendapole, Kwa Mfipa and Mwanabwito.

DACOF prepared the posters in Swahili for informing explanatory meetings about Input Credit with the date, time, place and contents at the beginning of February 2002. For preparing the posters, it was taken into consideration to realise diffusion to a greater number of farmers using illustrators in order to notify even to illiterates. It was also clearly stated in the posters that youths and women are very much welcomed. Consequently, DACOF put up the posters on the walls, trees, electric posts and so forth in each village. DACOF held workshops in four villages in February 2002 to explain details of Input Credit.

3) Third Credit
As a result of the previous credits, DACOF decided to give the third credit to farmers in Mwendapole and Kwa Mfipa. DACOF prepared posters in Swahili to inform explanatory meetings about Input Credit with date, time, place and contents in the middle of September 2002. DACOF held workshops at Mwendapole and Kwa Mfipa at the beginning of October 2002 to explain its details.

After the midterm evaluation, as mentioned in Activity 1-3, the procedure and details of implementation were revised, and the new methods were explained to the candidate farmers in December 2002.

Activity 1-5: DACOF (DAOF) gives CPMU members guidance on how to form groups
1) First Credit
DACOF identified and confirmed group members of Viziwaziwa in September 2001 which groups were formed in February 2001. Five groups were made with five members each.

DACOF proposed the farmers to form Input Credit group consisting of small credit groups to manage them by themselves. However, they said there exists CPMU already, so CPMU could function as Input Credit group. DACOF helped them to register CPMU to the Ministry of Home Affairs. CPMU members applied registration to the Ministry of Home Affairs on the 14th of September, and it was approved on the 17th November 2001. CPMU Viziwaziwa opened its bank account on the 16th September 2002.

2) Second Credit
DACOF gave the guidance on how to form groups to the farmers for the second credit through the workshops held in February and March 2002. As a result, five groups were made with five members in each group at Mwanabwito, Mwendapole and Kwa Mfipa severally. Two groups were formed with six members in each group at Viziwaziwa in May 2002.

3) Third Credit

DACOF gave the guidance on how to form groups to the farmers for the third credit through the workshops held in October 2002. As a result, five groups were made with five members of each group at Mwendapole and Kwa Mfipa severally.

After the midterm evaluation, the candidate members were re-screened in accordance with the newly made details of implementation and the members became three for Mwendapole and nine for Kwa Mfipa. Moreover, according to the new details, the joint liability was abandoned and the members were independently given the loan.

(2) Activity 2: Input Credit is implemented

Activity 2-1: Extension Officers receive training for Input Credit assistance

Five Extension Officers attended the first step of training carried out in "Activity 1-2: Staff members of DACOF receive training concerning management of Input Credit", and learned about roles necessary for assisting in the implementation of Input Credit in its second step. Additionally, they acquired necessary knowledge about horticultural technology to help farmers make full use of farm input through Training for Extension Officers held in August 2001, July 2002 and August 2003 as one of micro projects (Capacity Building of Extension Officers) of the Study.

Activity 2-2: Group leaders receive training concerning Input Credit

Group leaders received the practical training from DACOF in collaboration with Swissaid staff in the second step of training carried out in "Activity 1-2: Staff members of DACOF receive training concerning management of Input Credit". Additionally, they acquire knowledge about their roles in managing credit and basic bookkeeping through Training for Group Leaders held in October 2001 as one of micro projects (Capacity Building for Community) of the Study.

In July and August 2003, the additional training, for the targeted farmers to acquire leadership and business mind, was carried out with the collaboration of Centre for Microfinance and Enterprise Development (CEMIDE).

Activity 2-3: CPMU members receive basic training concerning Input Credit

CPMU members received basic training to grasp the contents and procedure of Input Credit as persons directly concerned through "Activity 1-4: DACOF explained about Input Credit to the farmers".

Activity 2-4: Extension Officers give assistance to CPMU members concerning contents of Input Credit

CPMU members need to decide the contents of Input Credit depending on their capability (labour, cultivated area, etc.). Extension Officers who have proper knowledge concerning horticulture gave them appropriate advice and helped them to fill the input applications with the assistance of DACOF

staff in September 2001 for the first credit farmers and in March 2002 for the second credit farmers. However, for the second credit farmers of Viziwaziwa, it was done in April 2002, as the recruitment was delayed due to insufficient activity of new recruits.

For the third credit farmers, it was carried out in December 2002 in accordance with the new details of Input Credit.

Activity 2-5: CPMU members apply Input Credit

CPMU members signed application forms prepared by DACOF with the contents decided by the farmers and handed them to the group leaders. The group leaders signed the Summary of Input Credit prepared by DACOF and submitted them together with the application forms of each group member to DACOF through CPMU. The Team gave assistance to DACOF staff for preparing the forms. They were done in September 2001 for the first credit, in March 2002 for the second credit except at Viziwaziwa (April 2002) and in December 2002 for the third credit.

DACOF recorded the loanees to Membership Register just after the application.

Activity 2-6: DACOF (DAOF) examines their applications

ADACO and DACT examined farmers' applications with assessment of farmers' farmland in collaboration with Extension Officers. Their farmlands were properly measured and each member's real area to be cultivated with the input loaned was confirmed and decided. In accordance with the result of this examination, the final application forms were prepared with the assistance of the Team. Farmland confirmation was carried out in September 2001 for the first credit, in March 2002 for the second credit except at Viziwaziwa (April 2002) and in December 2002 for the third credit.

DACO checked results of examination and assessment, judged if they were appropriate or not and gave approval on the appropriate applications. The farmers' groups whose applications were approved were informed. After the both sides agreed, agreements on Input Credit were made and signed by DACO and the group leaders (for the third credit, by DAOF and CPMU).

Activity 2-7: DACOF (DAOF) purchases and delivers farm input

1) First Credit

DACOF purchased and delivered the input in accordance with the applications in October 2001 at Viziwaziwa.

Additionally, DACOF delivered refinancing input from March till April 2002, to 12 farmers who required refinancing due to disaster to be mentioned in "Activity 2-9: DACOF assists the farmers in proper repayment".

2) Second Credit

DACOF purchased and delivered a part of the input such as seeds, manure and chemicals in May 2002 at Mwanabwito, Mwendapole and Kwa Mfipa to the farmers who required bringing forward the date for delivery due to timing of sowing.

DACOF delivered the remaining input to each group in June 2002. The input, including the input for the first delivery that was not delivered to the loanees at Viziwaziwa, was delivered to them at the same time. DACOF additionally delivered some seeds to 11 loanees at Mwanabwito, since they claimed insects damaged their plants that were sowed using the first input.

3) Third Credit

DAOF purchased and delivered a part of the input such as manure and chemicals in December 2002 at Mwendapole and Kwa Mfipa.

DAOF delivered the remaining input after the inspection confirming they had conducted proper cultivation on the proper land in January 2003.

4) Credit to CPMU Ruvu Darajani

CPMU Ruvu Darajani gave loan to the pump groups for cultivating vegetables from the money that they had paid as a part of pump repayment in 2002, and the groups repaid completely. With such experience, CPMU wanted to give the loan again, but unfortunately the money of CPMU was robbed in December 2002. The activity of CPMU was very vivid and they made the various records properly, and CPMU Ruvu was an example to other CPMUs before the robbery. However, the robbery made them discouraged. Therefore, DAOF decided to give a loan from the revolving fund to the pump groups through COMU, and purchased and delivered the input in June 2003.

Activity 2-8: Extension Officers give CPMU members proper guidance concerning full use of input

Extension Officers gave CPMU members proper guidance concerning full use of input after the delivery of each credit. Problems arising out of it were discussed in the periodical weekly meetings. The meetings are held for the following purposes.

- To collect savings
- To discuss problems
- To collect repayment
- To train farmers to be aware of membership benefits
- To monitor loanees' activities

The main problems discussed in the meetings were as follows.

- Difficulty of vegetable growing due to drought
- Poor attendance to the meetings
- Poor payment of savings

- Poor repayment
- Rescheduling
- Refinancing
- Forthcoming credit

Activity 2-9: DACOF (DAOF) assists the farmers in proper repayment

1) First Credit

There occurred disaster twice in this farming season, drought in the short rainy season 2001 and flood in the rainy season 2002, therefore DACOF applied the disaster clause of DACOF Policy in order to assist the farmers in proper repayment. However, most of them failed to repay on the final deadline of August 2002 due to, allegedly said, drop of vegetables' market prices in July and August.

On the other hand, the chairperson of CPMU Viziwaziwa and members started the cooperative farm in the middle of September 2002 to repay completely as the group of the first credit, since even they repaid completely, they could not get next loan due to other group members debts that came from the joint liability. DACOF judged the activities of the cooperative farm positive to express their effort for repayment and suspended the penalty till the end of December 2002.

However, even after the end of December 2002, they failed finishing the repayment, and the DAOF decided to raise this issue to Ward Executive Officer (WEO) for clearing off the bad debts.

2) Second Credit

The repayment started in the last week of August 2002, and the deadline of the repayment was in November 2002. However, the repayment was too bad achieving 21.3%. The main reason of bad repayment was, allegedly said, caused by sharp drop of vegetables' market prices.

The repayment by Viziwaziwa (2) and Mwanabwito was remarkably bad compared with Mwendapole and Kwa Mfipa. The repayment by Mwendapole and Kwa Mfipa was rather good, as it seemed the villages were conveniently located along the Morogoro Highway and villagers' awareness of credit is rather high.

The reasons of bad repayment were not only the abovementioned price drop but also there were a certain number of dishonest loanees who were reluctant to repay. DAOF judged as such and decided to raise this issue to WEO for clearing off the bad debts.

3) Clearing-off of Bad Debts

For the first and second defaulters, DAOF decided to raise this issue to Ward Executive Officer (WEO) for clearing off the bad debts as mentioned above. On the occasion of clearing off, DAOF adjusted the balance of debts in accordance with the following criteria.

- Penalties shall be omitted, since the penalties did not function to solicit repayment, and was

deducted from debts.

- Savings shall be transferred to repayment amount, since the group liability did not function to solicit repayment.
- Therefore the balance of debts shall be the principal plus interest minus repayment amount including the savings.

The Prosecution Board Meetings convened by each WEO were held in the Wards concerned in June 2003. All the defaulters admitted the amount of their debts. They were given several days grace, depending on the Ward, to complete their debts, otherwise their mortgage would be confiscated or they would be taken to court. However, the increase of the repayment rate was very small and was 7% in total.

4) Third Credit

The repayment started in April 2003, and the deadline of the repayment was in June 2003. However, the repayment was too bad. The drought was said to be the cause of bad repayment. The drought in this rainy season was, allegedly said, the worst in this quarter century. Since the middle of January 2003, they had nearly no rain till the end of May 2003.

DAOF judged this drought as natural disaster and applied the disaster clause remaking repayment schedule.

5) Repayment Rate

The following table shows the final repayment rate as of November 2003 when the final evaluation was conducted.

Table 4.2.3 Final Repayment Rate

	Credit Amount	November 2003	
		Repayment Amount	Repayment Rate
Viziwaziwa 1	3,078,010	1,808,230	58.75%
Viziwaziwa 2	1,318,750	483,170	36.64%
Mwanabwito	2,492,198	584,600	23.46%
Mwendapole 1	2,941,350	2,043,510	69.48%
Mwendapole 2	177,718	55,000	30.95%
Kwa Mfipa 1	2,805,930	1,929,090	68.75%
Kwa Mfipa 2	561,470	45,750	8.15%
Total	13,375,426	6,949,350	51.96%

(3) Activity 3: Set-up of Input Credit Management Foundation starts

Activity 3-1: DACOF (DAOF) maintains repayment properly for future revolving fund

DACOF started to maintain repayment amount in January 2002 and the repayment amount maintained is TShs 6,949,350 in November 2003. However, for future revolving fund, the total amount of

membership fee, passbook fee and application fee are added to repayment amount maintained and some expenditure is deducted. Therefore, the future revolving fund at present has amounted to TShs 7,192,000.

Activity 3-2: DACOF (DAOF) draws up plan of setting up Input Credit Management Foundation

DACOF started to consider drawing up plan of setting up Input Credit Management Foundation in July 2002, taking into account the transference of Input Credit to CPMU.

4.2.4 Achievement of Objective of Project and Outputs

(1) Project Purpose: The District is able to support smooth management of Input Credit by CPMU

- Since CPMU Ruvu Darajani was managing Input Credit properly supported by DAOF, one district out of four achieved the purpose, and the achievement rate was 25%.
- The Project Purpose before revision was not achieved, as the repayment rate of the credit carried out by DACOF (DAOF) in other villages was 52% and was low.

(2) Output 1: Staff members of Kibaha DACOF (DAOF) and CPMUs acquire ability to carry out Input Credit

- Since 17 farmers in Ruvu Darajani started Input Credit managed by CPMU, the achievement rate was 43% to the indicator of 40 farmers.
- The ability of only DACOF (DAOF) was targeted in the Output 1 before revision. However, it is hardly said that they could not acquire the ability due to the low repayment rate of the credit carried out by them, since the low repayment rate was attributed mainly to other reasons.
  CPMU Ruvu Darajani who was not included in Input Credit project before became able to carry out smooth management of Input Credit with the support of DACOF (DAOF). Therefore, it could be said that the staff members of DAOF acquired ability to support CPMUs' smooth management of Input Credit through implementation of its practical works.

(3) Output 2: Input Credit gets a proper start

- Since the repayment rate was 52% (the best rate was about 70% and the lowest was about 8%) for the credit implemented by DACOF (DAOF), the achievement rate was 65% to the indicator of 80%. It was hardly said that Input Credit implemented by DACOF (DAOF) got a proper start.
- On the other hand, the repayment rate at Ruvu Darajani achieved 100% for the credit implemented by COMU. Therefore, it could be said that Input Credit by CPMU Ruvu Darajani supported by DAOF got a proper start.

(4) Output 3: Kibaha DACOF (DAPF) starts to set up Input Credit Management

Foundation

- DAOF was properly managing the amount repaid including interest from the farmers, even though the repayment was insufficient.
- The total of TShs 7,192,000 was deposited in DACOF bank account as of November 2003, and this amount has exceeded the indicator of TShs 4,000,000.

4.2.5 Evaluation

The final evaluation paying attention to the five evaluation criteria, i.e., efficiency, effectiveness, impact, relevance and sustainability, was carried out in October 2003, and the evaluation workshop was held on the basis of the Report for Final Evaluation Workshop attached in Attachment. The main parts of the report are given hereinafter by each criterion.

(1) Efficiency

As a result of the activities carried out with a proper use of input, the expected outputs have been achieved to a certain extent, such as DACOF (DAOF) and CPMUs have acquired ability to carry out Input Credit, one CPMU has made Input Credit properly start, and so forth.

- Most of the input was properly committed, except motorcycle and computer, as they were delayed due to procurement problems. The input was effectively used as scheduled for performing the achievement.
- Staff members of DAOF acquired not perfect but certain ability to carry out Input Credit through implementation of its practical works. It is enough to support CPMUs to manage Input Credit smoothly.
- CPMU Ruvu Darajani started to manage Input Credit with the collaboration of DAOF, and its repayment rate reached 100%.
- As a result of the input and activities, DAOF was properly managing the amount repaid including interest from the farmers, and the total of TShs 7,192,000 was deposited in DACOF bank account.

(2) Effectiveness

As a result of a certain amount of the outputs' achievement, CPMUs have started the management of Input Credit following the success of CPMU Ruvu Darajani. Therefore, the Project Purpose revised is being achieved.

- Since CPMU Ruvu Darajani is managing Input Credit properly supported by DAOF who has ability to manage Input Credit to a certain extent, it is possible to say that Kibaha District has become able to support smooth management of Input Credit implemented by CPMU.
- The support by DAOF includes technical matters like providing knowledge to manage Input Credit, and so forth, but does not include financial assistance. The main cost needed is the transport fare for visiting the villages and going to Dar es Salaam with CPMU members to assist them to purchase farm input. Even if the District cannot secure a sufficient budget for Input

Credit, it is possible to support CPMUs, since the budget does not require a lot but the amount only for transport fare.

(3) Impact

Positive impacts on the horticultural development such as vitalisation of group activities, acquisition of agricultural technology, and so forth, were given to the target farmers. On the other hand, negative impact as legal punishment on the delinquents appeared.

- The members could get agricultural technology, increased the unit yield and became able to grow high quality produce. Therefore, 67% of the members answered their financial situation had improved.
- The chairperson of CPMU Viziwaziwa conducted the cooperative farms in collaboration with the credit members for completing repayment of all members in 2002. He resumed it in October 2003 using the earnings from the last year trial.
- The members became able to grow various kinds of vegetables, such as carrot, garlic, onion, eggplant, watermelon, green pepper, and so forth. Before the project, they only grew tomato and okra.
- Connection with the district officers and VAEOs has become intimate, and it has abated the structural poverty.
- CPMU Ruvu Darajani has revived since the pump groups got Input Credit through CPMU, funded from the revolving fund.
- Legal punishment on the delinquents was laid.

(4) Relevance

This project was carried out in accordance with PDM prepared in the Plan of Operation. However, the mid-term evaluation revealed that the original plan had the difficulties in implementing it due to improper implementing organisation, situation of targeted area, lack of farmers' awareness on credit, and so forth. Therefore, the original plan was revised, and the project was carried out at a village in accordance with revised PDM for the new plan. As a result, the revised Project Purpose of the project is relevant, judging from the relating government policies and farmers' needs.

- The project purpose coordinates with agricultural development policy of Tanzania.
- The district agricultural officers have intention to implement Input Credit and train farmers of Input Credit Management.
- CPMUs hope to conduct Input Credit by themselves.
- 96% of loanees feel like to continue Input Credit.

(5) Sustainability

Provided that CPMU implements Input Credit with the support of DAOF, it can be judged to be sustainable.

- It is confirmed by DALDO that all the trained staff members of DAOF will stay.
- All the districts are requiring budgets, but they have never disbursed for the project continuation.

However, it is possible for DAOF to support CPMUs, since there is no need of a large amount of budget to support CPMUs' Input Credit management but only an amount for transport fare, and so forth.

- It is possible for CPMU to carryout Input Credit sustainably, provided that the CPMU is firm in its organisation before commencing the credit as Ruvu's case has proved.
- Fourteen loanees among ones who repaid completely have cultivated vegetables twice or three times using the profit from the first credit, and its sustainability was proved.

4.2.6 Analysis and Lessons Learned

(1) Favourable Outputs

There are several favourable outputs that have been taken by the members concerning this micro project. The significant outputs derived from the implementation are summarised below.

- The chairperson of CPMU Viziwaziwa started to conduct the cooperative farms in collaboration with the credit members for completing repayment of all members.
  He started this scheme because the loanees who had completed the repayment cannot get next credit due to joint liability. It means joint liability is functioning in the sense of a big credit group, even though the joint liability has not functioned in the sense of small credit groups. Moreover, group solidarity was derived from this activity.
- The members could acquire agricultural technology, there are some farmers whose unit yield has more than doubled and the members became able to grow high quality produce. Therefore, 67% of the members answered their financial situation had improved. Additionally, the members became able to grow various kinds of vegetables, such as carrots, garlic, onions, eggplants, watermelons, green peppers, and so forth. Moreover, 14 loanees among the ones who repaid completely have cultivated vegetables twice or three times using the profit from the first credit, and its sustainability was proved.
  This is the result of interaction of the micro projects with input delivered, VAEOs' suggestion who got the training and the farmers' training. Additionally, the effect, such as the introduction of new vegetables, derived from District Seedling Farm Programme is not negligible.

This micro project has many points to be improved. However, since there are some favourable outputs as mentioned above, this micro project shall be included in the Master Programme taking the following lessons learned into consideration.

(2) Implementing Organisation

<u>The government organisation is not suitable as implementing body of micro credit. The implementing body shall be CPMU, and the government organisation shall support and supervise CPMU as a body who has knowledge concerning how to implement the micro credit</u>

The objective of this micro project was capacity building for the district officers. Therefore, the district

was set as the implementing organisation. Concerning their ability to carry out Input Credit, they have already acquired basic knowledge of its operation, but it is hardly said the ability to make proper use of its knowledge is sufficient. It is expected that they will acquire how to use the basic knowledge through its practical operation continuously.

On the other hand, since the district was set as the implementing organisation, the followings are pointed out. (a) Exaction of repayment was halfway due to lack of incentive for the district officers to force the loanees to repay. (b) The loanees did not create a sense of duty for repayment, assuming that the credit would be a gift, and expecting that the government would extend the repayment deadline or cancel the debt.

In general, insufficient and ineffective management ability, halfway of exaction and loanees' expectation to extension of repayment deadline and cancel of debt by the government are pointed out for difficulties occurred from the credit scheme run by the government. Grameen Bank system achieved a breakthrough in those difficulties. This system is based on the group forming in the rural area and relies on intensively trained staff employed from outside of the area, and its operation cost is high. This micro project, Input Credit, was a replica of the Grameen Bank system contradictorily carried out by the district officers. Consequently, the repayment rate became small.

As mentioned above, the government organisation is not suitable as implementing body of micro credit. It is not so easy for the government officials who have routine duties to concurrently hold other job such as banker. Therefore, the implementing body shall be a farmers' union to create its ownership to the farmers, and the government organisation shall support and supervise the union. In this case, the organisation of farmers' union shall be firm before starting credit, by implementing other activities, as Ruvu's case has proved it. Their repayment for the credit from the revolving fund has been on schedule, moreover they have started to repay for the pumps. It can become a good example of the smooth management of Input Credit implemented by CPMU with the support and supervision of DAOF. The activity of CPMU Ruvu Darajani was very vivid and they made the various records properly, and CPMU Ruvu was an example to other CPMUs before the credit that is showing its success.

As running costs of banking business, the government has to prepare a certain amount of budget. However, it does not cost a lot but requires the amount simply for transport fare to support and supervise technically only. Therefore, even if the government cannot prepare a big amount of budget, it is possible to support and supervise the union to manage Input Credit.

The lessons learned concerning implementing organisation derived from this micro project implemented shall be taken into consideration for finalising the Master Programme.

(3) Liability and Mortgage

The joint-reliance that was one of the means for exaction did not function properly. Execution of

savings as collateral was not thorough as well. Therefore, a certain amount of savings as collateral shall be collected before disbursement of loan.

In the original Master Programme, as it was concluded that the farmers concerned did not have enough money to spare for savings and appropriate properties to be mortgage, the joint-reliance only was applied. When the Verification Study started, since the local NGO recommended applying savings and the farmers agreed to pay for savings, the savings as mortgage was introduced adding to the joint-reliance.

It is considered that almost all loanees do not have a sense of duty for repayment and that caused malfunction of the joint-reliance. The joint-reliance can function only with the situation that everybody has a sense of duty for repayment. Additionally, they have little custom to ostracise ones in the village and it caused its malfunctioning.

In the Verification Study, the decision to introduce the savings was decided one month before the disbursement of farm input, and the collection of savings started after the disbursement. Therefore, execution of savings as collateral was not thorough as well. It is pointed out that the savings started after the disbursement had no compelling power. If the savings as collateral are introduced, a certain amount of savings should have been collected before the disbursement. Consequently, it creates a closed structure where somebody who is considered to be a fellow member shall be responsible for repayment, and they will have an economic incentive to make exaction. It means that the savers suffer a loss if somebody does not repay. The loanees simultaneously savers watch strictly one another.

DAOF raised the delinquents to Ward Executive Officers (WEO). As a result, WEO required them to submit mortgage, and half of them submitted it. Thus legal exaction was carried out, but the repayment was not bettered after all. Since, the administration system to attach the mortgage was not completed and the farmers somehow did not care if they were taken into custody, the legal exaction did not work properly.

The lessons learned concerning liability and mortgage derived from this micro project implemented shall be taken into consideration for finalising the Master Programme.

(4) Selection of Loanees

Screening is very important to select proper loanees, and the method of selection to prevent unfitted loanees shall be elaborated sufficiently.

Although the loanees were selected in accordance with the conditions and procedure drawn up, there existed the following unfitted loanees who have contributed to bad repayment. (a) Ones who were insincere, as they did not make repayment although they earned a certain amount by vegetable cultivation. (b) Ones who did not have any basic knowledge and skills to cultivate vegetables. (c) Ones

who were lazy and reluctant to work at the farmland. (d) Ones who did not grow vegetables at the farmlands where DACOF assessed and acknowledged. (e) Ones who were not well known to group members and caused malfunction of joint-reliance.

Among those unfitted loanees, (a) and (d) were not curbed by the above-mentioned conditions, and such defective conditions are to be pointed out. Concerning other unfitted loanees, although they were curbed by the conditions, they were crept in at the time of selection, since the short period of screening did not enable to discover candidates' character, personality, their experience, and so forth. It occurs from the particular problem of the money market in developing countries that the collection of loanees' information is hard due to thin population.

The items of conditions not included should have been included, even there is possibility of missing of such loanees due to insufficient screening. The result of the screening should have been reconfirmed through inquiry among village officers after the screening by CMPU and DACOF to complete the screening.

As mentioned above, screening is very important to select proper loanees. Even though lenders examine the farmers' application strictly and the group members themselves decide their colleagues, some unfitted loanees crept in. To prevent such loanees to be grouped in, selection of loanees/group members shall be well considered.

For example, a certain period shall be put to observe if the loanees are honest or lazy and the group members are really acquainted well with one another or not. Therefore it is recommendable to put the period for observing them starting the loan with very small amount, and the amount shall be gradually increased. It is also needed to put a certain period to train the loanees to be skilful at basic farming. In order to perform such needs, some experimental period with small amount of loan shall be recommended.

It was also pointed out that loanees' awareness creation concerning the concept of the loan was insufficient. Training of loanees' awareness creation on the perception that the loan is not a gift and is to be absolutely repaid should have been reinforced, adding such curriculum and prolonging the training course.

The lessons learned concerning selection of loanees derived from this micro project implemented shall be taken into consideration for finalising the Master Programme.

(5) Loan Amount

Loan amount shall not be big for the small-scale farmers.

There were some causes that prevent smooth repayment, and the big loan amount was one of them. The loan amount should have been minimised to avoid risk of bad debts, since the amount of bad

debts cannot exceed the loan amount. The maximum amount should have been set in accordance with the annual income of the loanees taking their repayment capacity into consideration, and they could repay with the smallest difficulty even when they had arrears.

The maximum loan amount was set TShs 120,000 in the Verification Study following the original Master Programme. This amount corresponded to the cost for purchasing farm input to cultivate 0.5 acres (0.2 ha) of farmland that was a proper area to cultivate by one farming family in Japan. DAOF prepared the standard application rates of farm input corresponding to that area and recommended the farmers to apply what they needed. As a result, most of the farmers applied the maximum amount, and the contents of input were inadequately assessed. That is why most of all loanees borrowed the maximum amount.

On the other hand, Input Credit was drawn up on the assumption that DACOF manage it continuously. For its continuous operation, it is needed to maintain its running cost born by interest imposed, and loan amount should be a certain amount to bear the running cost. It could be pointed out that it was another reason why the assessment concerning loan amount and contents became halfway. It is necessary to reconsider DACOF system when the loan amount is considered to be reduced.

Taking into consideration the case of Ruvu, the amount loaned to the group (2 to 5 members) was not so big (about TShs 80,000), and they have made proper earnings to repay not only the amount of loan but also TShs 100,000 per group for the debt of pump.

As the case of Ruvu has proved, even though the loan amount is not so big, the satisfactory effect is expected. The maximum loan amount shall be set in accordance with the annual income of the loanees taking their repayment capacity into consideration, and they can repay with the smallest difficulty even when they have arrears. Including review of the implementing organisation, the lessons learned concerning loan amount shall be taken into consideration for finalising the Master Programme.

(6) Stable Water Source

The loanees shall have stable water sources.

Even the input was delivered properly and sufficiently, cultivation was not properly done due to lack of water derived from drought. The success of the case of Ruvu was derived partly from year round existence of water pumped up from the Ruvu River.

In case of loan for vegetable cultivation, loan shall be given to only farmers who have stable water sources and do not rely only on rainfall in the area where irregular weather is common. For assessing the farmers' capacity to secure water, do not believe their statements straight, and examine weather conditions and water sources conditions strictly. Once some doubts are arising, stop pledging credit.

The lessons learned concerning stable water source derived from this micro project implemented shall be taken into consideration for finalising the Master Programme.

(7) Number of Vegetables to be Cultivated

Loanees shall grow more than one kind of vegetables to avoid risk incurred by sharp fall of market price.

Vegetable market prices fell sharply, and it hampered proper earnings. Such fall and weather conditions, especially rainfall, are somehow closely linked. Therefore, the above-mentioned stable water source is essential. Moreover, the loanees shall grow more than one kind of vegetables simultaneously to avoid risk incurred by sharp fall of market price. It is also better to grow vegetables where prices are not affected by the market price.

The lessons learned concerning number of vegetable to be cultivated derived from this micro project implemented shall be taken into consideration for finalising the Master Programme.

4.3 Process and Evaluation: Improvement of Watering

4.3.1 Project Design Matrix

The Project Design Matrix of Improvement of Watering is shown in the Attachment. The following is a summary.

Overall Goal	* Improvement of Watering drawn up in the Master Programme is carried out in proper places.

Project Purpose	* Farmers are able to carry out improved watering method adequately and continuously.
Output	1 Farmers have a proper understanding of improvement of watering method in collaboration with DSMS. 2 Farmers become able to operate and maintain watering facilities adequately.
Activities	1 Farmers' group learns improvement of watering 1-1 Farmers form groups who cope with improvement of watering method. 1-2 Farmers' group owns a portable pump jointly. 1-3 Farmers dig down Kisima with sheeting. 1-4 Farmers' group draws up watering plan in collaboration with DSMS. 1-5 Farmers' group draws up operation and maintenance plans of facilities and equipment in collaboration with DSMS. 2 The farmers' group carries out watering using pump in collaboration with DSMS 2-1 Farmers carry out watering using pump in collaboration with DSMS. 2-2 Farmers' group maintains portable pump properly. 2-3 Farmers' group maintains appurtenant facilities properly.
Input	[JICA] Personnel 1) Leader (1) 2) Expert: Irrigation (1) 3) Expert: Agronomist (1) Equipment 1) Engine Pump (10) 2) Treadle Pump (5) Material 1) Cement (Water tank) 2) Timber (Kisima) [Tanzania] Personnel 1) DSMS: Irrigation (1) 2) Extension Officers (3) Material 1) Farming Material 2) Fuel

4.3.2 Process of Inputs

Engine pumps and treadle pumps were distributed to the farmers in October 2001. There was a delay of nearly one month, since it took longer than expected to select pump types.

4.3.3 Process of Activities

(1) Activity 1: Farmers' group learns improvement of watering

Activity 1-1: Farmers form groups who cope with improvement of watering method

Farmers formed pump groups in the workshops conducted in February and March 2001. A pump group basically consists of five members, and five groups were formed in Viziwaziwa, Mwanabwito and Ruvu Darajani severally. The groups were formed taking into consideration the following conditions.

- Water source for watering shall be secured.
- Distance between farm and water source shall not be far, as the pump head is limited.
- Farms of each member shall not be broadly scattered as they jointly use the pump.

A group leader and a treasurer were selected from the five members of each group.
Actual field conditions such as farm size, distance between farms and water source were investigated in September 2001.

Some members withdrew from the groups because of the following reasons in Viziwaziwa where treadle pumps were recommended as described in Activity 1-2.

- Using the treadle pump takes more time than plastic containers for farmland near the water source. Therefore farmers, who are still young and confident of their physical strength, withdrew from the groups.
- Pump would require at least two farmers to operate, one for treadling and the other for holding the water hose. Farmers, who wanted to continue working alone withdrew from the groups.

Moreover, one group totally quitted this operation in Mwanabwito, and new candidates appeared. CPMU Mwanabwito has acknowledged the new members, but DPMC has declined the acknowledgement, since they are the defaulters of Input Credit.

Activity 1-2: Farmers' group owns a portable pump jointly

The recommended types of pump are engine pumps (2 inches) for Mwanabwito and Ruvu Darajani, and treadle pumps for Viziwaziwa according to the availability of water. Those pumps were provided to the farmers after demonstration in October 2001. In Mwanabwito and Ruvu Darajani, farmers relatively easily get water all year round due to the vicinity of the Ruvu River. On the other hand in Viziwaziwa, farmers cannot expect the expansion of arable land because of the limitation of water availability.

The workshops were held with all pump group members at all sites in the middle of January 2002 to discuss the schedule of repayment to CPMU for pumps and accessories. According to the first agreements, all members should have completed the repayment of the first year (2001 to 2002) by the end of March 2002. But mainly due to the drought conditions during the short rainy season, members requested to reschedule the repayment.

However, the repayment done was very poor and was TShs 734,890 in total in November 2003. Ruvu Darajani achieved TShs 509,890, Mwanabwito achieved TShs 225,000 and no repayment was recorded for Viziwaziwa.

Activity 1-3: Farmers dig down Kisima with sheeting

Improvement of Kisima involves earth retaining with wooden frame, which can increase the depth of the existing Kisima to about 50 cm comparatively easily.

One villager in Viziwaziwa, where their farming has been relying on Kisima as water source, dug down Kisima 50 cm deeper and set a wood sheeting in February 2002. The Kisima, which was improved, is almost 3 m in diameter and 2 m in depth. Even though the surrounding farmers have acknowledged its functional convenience, they remain reluctant to improve their Kisima, since most of the farmland is hired.

Activities 1-4: Farmers' group draws up watering plan in collaboration with DSMS

Farmers together with the district officers and the Team prepared a watering plan in November 2001 taking into account the followings.

- Watering area: District Subject Matter Specialist (DSMS) or extension officers measured size of farmland with farmers. Sizes of farmland were found varying from 0.1 ha to 3 ha.
- Place of intake: It was explained to the farmers that distance from the water source and the place to set the water tank were the major factors affecting the efficiency of watering. This means that where distance was too long, initial cost and running cost would be high.
- Pump types: Two pump types were considered; treadle pumps for Viziwaziwa and engine pumps for Mwanabwito and Ruvu Darajani. The treadle pumps cannot contribute to expansion of cultivated land, since the water source is Kisima and is limited, while the engine pumps can, since the water source is the Ruvu River and has abundant water.

  Additionally, operation costs of each pump were explained to the farmers. Especially in Viziwaziwa, disadvantages using engine pumps for Kisima were explained.
- Storage of equipment: Pumps, water tanks and hoses are farmers' properties who shall pay attention to the safekeeping of these properties.
- Irrigation method: Irrigation method is an important factor affecting running costs and size of cultivable land.

The chairpersons of the pump groups of Mwanabwito and Ruvu Darajani applied water right from the Ruvu River to the Central Water Board Unit in October 2001.

Watering with different periods of interval was verified at Viziwaziwa. Three watering frequencies were tested, which were once everyday, once every two days and once every three days. Once every two days watering frequency has some possibility of adoption by farmers.

Activities 1-5: Farmers group draws up operation and maintenance plans of facilities and equipment in collaboration with DSMS

The district officer who executed the demonstration of pump operation at each village explained how to operate and maintain the machine on a daily basis in November 2001. Manuals attached by the dealer of the pumps were translated into Swahili and distributed to the group members. The appropriate records were designed by DSMS and distributed to the members. The members have been taking the record each day.

(2) Activity 2: Farmers' group operates improvement of watering

Activities 2-1: Farmers carry out watering using pump in collaboration with DSMS

The first season of using the pumps commenced in the middle of December 2001.

In Mwanabwito and Ruvu Darajani, the farmers were able to avoid the influence of drought that occurred in the short rainy season due to the pumps, but pest attack was experienced due to budget

shortage for buying pesticides. Therefore, the result of using pump was not satisfactory.

In Viziwaziwa, the members seemed to have lost interest in using the treadle pump, since this requires longer time to watering than using a watering can, and also each pump requires two people for operation.

In Ruvu Darajani, the Tanzania side decided to hand the input from the revolving fund to CPMU Ruvu Darajani in June 2003, for giving a loan to the pump groups, since the groups have the experience of loan for purchasing farm input from CPMU and repaid completely in July 2002. It aimed at reinvigorating CPMU Ruvu Darajani, promoting vegetable growing with the multiplier effect of providing together water and input to one group, securing good yield through Input and ensuring smooth repayment with trustworthy loanees.

Activities 2-2: Farmers' group maintains the portable pump properly

As designed on Activity 1-5, the recording sheets for maintenance were printed and distributed to the members. They followed the instruction of DSMS on the way to fill out the sheets and started using them from the beginning of January 2002. They used the sheets for these daily operation and maintenance. Due to their proper checking and maintenance, the pumps were in good order.

In Viziwaziwa, as mentioned in Activity 2-1, they became reluctant to use the treadle pumps, therefore CPMU Chairperson collected and stored them in the storeroom of the multi-purpose shed.

Activities 2-3: Farmers' group maintains appurtenant facilities properly

About the appurtenant facilities, a safe storage place was secured. So far, the members have been maintaining those facilities by the same way as they do for the machine. Due to their proper checking and maintenance, the facilities have been in good order.

4.3.4 Achievement of Objective of Project and Outputs

(1) Project Purpose: Farmers are able to carry out improved watering method adequately and continuously

- Forty-three per cent of the farmers concerned became able to carry out improved watering adequately. Excluding Viziwaziwa where the treadle pumps were used, 71% of the farmers became able to carry out watering adequately, and the achievement rate was 89% to the indicator of 80%.
- The pump group members at Ruvu Darajani carried out vegetable cultivation properly and were able to complete repayment of the pumps with some delay from the schedule.

(2) Output 1: Farmers have a proper understanding of improvement of watering method in collaboration with DSMS

- Seventy-two per cent of the group members showed their will to continue in total, and the achievement rate is 90% to the indicator of 80%.
- The farmers concerned understood the usefulness of improving Kisima and watering intervals.

(3) Output 2: Farmers become able to operate and maintain water facilities adequately

- Sixty-seven per cent of the pumps introduced were running, and the achievement rate was 96% to the indicator of 70%.
- The pump members were keeping daily record provided by DSMS and were exchanging engine oil according to running time.
- Several farmers did not follow the schedule they made in Mwanabwito.

4.3.5 Evaluation

The final evaluation paying attention to the five evaluation criteria, i.e., efficiency, effectiveness, impact, relevance and sustainability, was carried out in October 2003. The evaluation results are given hereinafter by each criterion.

(1) Efficiency

As a result of the activities carried out with a proper use of input, the expected outputs have been achieved to a satisfactory level, namely, the farmers have understood the usefulness of watering by pump, improving Kisima and watering intervals; and they have become able to operate and maintain watering by engine pump adequately. Moreover, a farmer is continuously using the treadle pump understanding its usefulness.

- Engine pumps and treadle pumps were distributed to the farmers in October 2001. The input was effectively used.
- The farmers concerned understood the usefulness of watering by pump through drawing up the watering plan. The farmers with the engine pumps were implementing adequate and continuous watering and its maintenance autonomously.
- The farmers in Viziwaziwa quitted to use the treadle pumps, since such pumps are not adoptable there. However, a farmer there is still using it believing its usefulness.

(2) Effectiveness

As a result of a certain amount of the achievement, the farmers in Mwanabwito have started to carry out improved watering using engine pumps adequately and continuously following the success of CPMU Ruvu Darajani. Therefore, the Project Purpose is being achieved the case of engine pumps. On the other hand, only one farmer has been using a treadle pump continuously in Viziwaziwa. Accordingly, the Project Purpose concerning the treadle pumps has not yet achieved.

- The farmers concerned in Ruvu Darajani understood the usefulness of engine pumps as a means of improvement of watering method and became able to operate and maintain watering facilities properly, which they were carrying out adequately and continuously. The Project Purpose will be achieved there, if they can continue the same path, and complete repayment of the pumps.
- The activities of the farmers concerned in Mwanabwito are not satisfactory, even if their activities became vital having started to recognise the importance of watering with pump. However, they are advancing their pump activities aiming at continuous and adequate use of the pumps receiving the stimulation of Ruvu's case.
- In Viziwaziwa, the members quitted the treadle pumps, but one member still believes their effectiveness and is trying to use them.
- The farmers concerned understood and admitted the convenience of improving Kisima, but they were reluctant to adopt it, as most of their land was hired.
- Having conducted some examinations on watering intervals, CPMU Chairperson in Viziwaziwa became interested in the experiment of watering, and is presently carrying out watering twice every three days.

(3) Impact

Positive impacts on the horticultural development such as vitalisation of group activities, acquisition of agricultural technology, labour saving, and so forth, are made on the target farmers.

- The members could get agricultural technology, enlarged area for vegetable cultivation through labour saving and increased yield. Therefore, 73% of the members answered their financial situation had improved.
- The members became able to grow various kinds of vegetables, such as carrot, garlic, onion, eggplant, watermelon, green pepper, and so forth. Before the project, they only grew tomato and okra.
- Connection with the district officers and VAEOs became intimate, and it abated the structural poverty.
- The members learned the merit to work as a group.

(4) Relevance

This programme is in line with farmers' needs, at the same time with the national policy promoting agricultural development.

- The project purpose coordinates with agricultural development policy of Tanzania.
- The district agricultural officers have the intention to implement the Improvement of Watering and train farmers.
- Seventy-two per cent of group members feel like continuing the Improvement of Watering.

(5) Sustainability

Provided an adequate area and appropriately selected farmers and projects, the operation can be sustainable.

- If they can continue the same path at Ruvu Darajani, and are able to complete repayment of the pumps, their operation will be sustainable.
- Sustainability is expected on the future activities for the groups at Mwanabwito, though their activities have not been satisfactory.
- The farmers were just relying on rain for growing vegetables before the project, but they became recognising the importance of watering, and started it at Mwanabwito. Moreover, the dissemination of this project is possible, since other farmers around also recognised the importance of watering and started to water the crops.
- All the districts are requiring budget for the project continuation, though they have not made any disbursement yet.

4.3.6 Analysis and Lessons Learned

(1) Favourable Outputs

There are several favourable outputs that have been taken by the members concerning this micro project. The significant outputs derived from the implementation are summarised below.

- It became possible to water 800 plants a day, and it was a big progress compared with 300 plants before using pumps. Even without rain, watering twice every three days, which had been done everyday before, was confirmed possible depending on the weather conditions, and the farmers have started to implement it. Thus, labour saving materialised, and some farmers could enlarge their area for vegetable cultivation and increase yield and earnings.
- Before, they could grow vegetables only after the rainy season, the members became able to grow vegetables all year round due to the pump project. They could also acquire agricultural technology joining this micro project, and became able to grow various kinds of vegetables. Moreover, other than the members, some farmers around who were just relying on rain for growing vegetables also recognised the importance of watering and started to water crops.

These favourable outputs have derived from the result of interaction of the micro projects with the outcome of this improvement of watering, VAEOs' suggestion, who got the training, and the farmers' training. Additionally, the effect derived from the District Seedling Farm Programme is not negligible. Since there are some favourable outputs as mentioned above, this micro project shall be included in the Master Programme as a materialised sub-program of Watering, taking the lessons learned into consideration.

(2) Conditions for Effectiveness of Engine Pump

Engine pumps are effective, provided that water sources are perfectly secured. However, some more conditions are needed for this micro project to reach success. The conditions are that farm input shall be properly prepared, the group members are willing to carry out the projects and are honest enough to work together, and leadership shall be strong.

This micro project offered only pumps without any farm input. However, once the group members got the pumps and commenced cultivation, they failed to purchase the input properly and could not repay for the pumps due to poor growth of crops using poor seeds with little fertiliser, and crop damage caused by insufficient chemicals for effective use of engine pumps. Although the members had agreed to implement this project, saying they could bear the material and fuel costs, they could not purchase them due to economical problems. As such the farmers have a tendency to easily reach an agreement on issues they know difficult to realise even in future. Taking this into consideration, stable measures shall be planned at the commencement stage of the project, such as the inclusion of the farm input that are indispensable for the activities and as objectively difficult for them to purchase.

As one of the conditions, farmers' awareness, such as willingness to carry out projects, honesty to work together and strong leadership, shall be considered. Even though both Mwanabwito and Ruvu Darajani groups live along the Ruvu River that is their common water source, their activities are very different. The following table shows the comparison between Ruvu Darajani and Mwanabwito.

Table 4.3.1 Comparison between Ruvu Darajani and Mwanabwito

Condition	Ruvu Darajani group	Mwanabwito group
(Farmland Condition)		
Site	Along Ruvu river	Along Ruvu river
Distance from houses	Near	Far
Size of area	1 acre each group, total 5 acres	Normally less than 1 acre for each group
Flood in March 2002	Seriously damaged	Seriously damaged
(Group Formation)		
Group farm condition	5 groups together	5 groups are separated to one another
Farming style	Each group and all the groups are united	3 groups individual, 2 groups united
Group discussion	Every Saturday	Poor attendance, Getting fewer
Group leader	Each group leader work hard	Lack of leadership, Improper bookkeeping, Opaque balance
Leading group	Existed	Non
(Farming Condition)		
Farming plan	Made before the season	Non
Pump operation	Keeping a daily record	Before kept a record but now no record
Input use	Have knowledge of using input and purchase it	Rarely use chemical and fertiliser
Level of farming	Normal level but learning by themselves	Need to be trained for farming with irrigation
Produce	Okra, tomato, eggplant, sweet pepper, water melon	Mainly Okra and tomato
Distance to market	Along the national road	12 km to the national road
Extension officer	Frequent visit and good guidance	Frequent visit but need more intensive care
(Repayment)		
up to November 2003	35%	10% (2 groups paid nothing)

Enthusiastic farmers are not so many in Mwanabwito, as they themselves say, and they do not have business mind. On the other hand, Ruvu groups are keen on business chances and are always seeking opportunities. They are cooperative. As shown in the table, Mwanabwito is located deep inside from the Morogoro Road and is isolated from various kinds of information. On the other hand, Ruvu Darajani is located along the Morogoro Road, and the villagers can easily get information from the passengers. This difference appears in their willingness to carry out projects. Concerning the honesty to work together, it is presumed from the observed group farming and frequent discussions among the farmers in Ruvu Darajani. This situation is opposite in Mwanabwito. Moreover, concerning the strong leadership, it is presumed from the honesty of the leaders and proper keeping of records in Ruvu Darajani.

As such, it was revealed as lessons that securing the farm input and awareness creation in group promotion was needed for effective use of engine pumps. The lessons learned concerning engine pumps derived from this micro project shall be taken into consideration for finalising the Master Programme.

(3) Farmland

The farms of the groups shall be located at one place so that groups can monitor one another progress of cultivation and yield, and income and repayment for the pumps.

The lessons learned concerning farmland derived from this micro project shall be taken into consideration for finalising the Master Programme.

(4) Treadle Pump

Treadle pumps shall be introduced to the area where amount of water source is small with a reservoir as a relay point constructed in the middle of the water source and the farmland.

Treadle pumps were not used in Viziwaziwa due to the following reasons.

- Two persons are needed to water with the treadle pump; on the other hand one person can perform watering with a poly-tank.
- Hoses of the pump are heavy and are troublesome especially when changing furrows.
- Hoses damage plants when changing furrows.

However, treadle pumps shall be recommended for places with limited water sources or small amount of water, since engine pumps are too big in capacity. In such places, taking the above-mentioned problems into consideration, it is better not to use the treadle pump directly for watering crops. When the treadle pumps are introduced, they shall be applied for such case as watering crops at farms far away from the water sources. In the said case, a reservoir shall be constructed between the source and the farms, and the water shall be conveyed to the reservoir using the treadle pump. Subsequently, the crops are watered using polyethylene tanks.

Once the treadle pumps are decided to be introduced, the above-mentioned lessons learned derived from this micro project implemented shall be taken into consideration for finalising the Master Programme.

(5) Land Ownership

Land ownership shall be grasped before planning for the project with the facilities.

Most of the farmland for the group members was hired. Therefore, even though they acknowledged the convenience of improving Kisima, they did not feel the need to improve it, as they had to shift the land next year. The ones who cultivate on the hired land cannot make any permanent facilities. Even

for the treadle pumps, there was an idea to build a reservoir between Kisima and the farmland as mentioned above. Due to the ownership of the land, it was impossible. It is also impossible to build an earth reservoir at Viziwaziwa, as the soil there is sandy. Even for small-scale facilities, once permanent ones are included in the project, the land ownership shall be grasped before planning, since the problem of land ownership will arise.

The lessons learned concerning land ownership derived from this micro project shall be taken into consideration for finalising the Master Programme.

4.4 Process and Evaluation: Capacity Building for District and Extension Officers

4.4.1 Project Design Matrix

The Project Design Matrix of Capacity Building for Extension and District Officers is shown in the Attachment. The following is a summary.

Overall Goal	* Extended community based development program in M/P shall be conducted.
Project Purpose	* Enable extension officers to train farmers better so as to increase the number of farmers who consult the extension officers.
Output	1 Extension officers improve technological knowledge on horticulture. 2 Extension officers get advanced information on community based development and extension methodology.
Activities	1 Extension officers are trained on horticultural technology and make its manual in cooperation with District Officers 1-1 Extension officers are trained on horticultural technology. 1-2 District officers and extension officers make a manual of horticultural technology. 2 Extension officers are trained on participatory development method 2-1 Extension officers have a training on people's participation method.
Input	[JICA] Personnel 1) Leader (1) 2) Horticulturist (1) 3) Participatory (1) Equipment 1) Computer Material 1) Material for making Curriculum 2) Extension Officers Training [Tanzania] Personnel 1) DSMS 2) Extension Officers Material 1) Material for making Curriculum

4.4.2 Process of Inputs

Most of the input was properly delivered in time, quantity and quality, and was used on schedule.

4.4.3 Process of Activities

(1) Activity 1: Extension officers are trained on horticultural technology and make its manual in cooperation with District Officers

Activity1-1: Extension officers are trained on horticultural technology

The training was carried out aiming at selecting standard for farming techniques on horticulture crop and applying intensive training of essential horticulture farming technology to Village Agricultural Extension Officers (VAEO), Ward Agricultural Extension Officers (WAEO) and District officers who were directly involved with farmers. Training in horticultural technology was held in August 2001, July 2002 and August 2003, and the training was carried out for the 14 days. Number of trainees was more than 20 each year.

The contents of the horticultural technology include Land preparation, Planting, Husbandry, Pest control, Diseases control, Harvesting and Storage/transport for each crop, which is grown in Coast Region and prospective crops that could be expanded in the Region considering their high value. The crops of vegetables are Okra, Sweet Pepper, Cucumber, Tomato, Watermelon, Pineapple, Garlic, Indigenous Vegetables, Mushroom, Amaranthus, Carrot, Eggplant and Onion. The crops of fruits are Mango, Banana, Avocado, Passion Fruit and Citrus - Orange.

In the questionnaire, most said that they had acquired more new knowledge and skill than expected in the course, which they thought, was very much related to their job. Most also said that the courses were fairly difficult to them, owing mainly to the short time allocated to complete all the material. Discussion between groups and practical sessions were rated the most positive aspects of the course.

Activity 1-2: District officers and extension officers make a manual of horticultural technology

The making of the horticultural manual, including technological packages and impact points on major crops that were covered in the training to improve and strengthen on-farm activities, started in September 2001. District Agricultural Extension Officers from the four districts of Kibaha, Bagamoyo, Kisarawe and Mkuranga participated under the Chairpersonship of the RAA in its development. The manual also provides information on extension methodology referring specifically on ways to effectively deliver the information to farmers.

The curriculum for extension officers training has been completed as well and will serve as a reference for teaching extension officers in Horticulture together with the daily record book format for VAEOs to help them monitor their daily activities. Such topics as Principles of Crop Production, Soil Science, Extension Methodology, Agricultural Mechanisation, Human Nutrition and Food Technology, Natural Resources Management, Crop Husbandry and Crop Protection, Agribusiness, and Small Scale Irrigation, etc are included in the curriculum.

(2) Activity 2: Extension officers are trained on participatory development method

Activity 2-1: Extension officers have training on people's participation method

Along with the technical training in horticulture specified above, extension officers were also empowered in community-based development training to enable them to assist farmers and project beneficiaries in their day-to-day activities, including project management and operation, group organisation and problem identification and its solution. Such training introduced some tools used in participatory development approaches such as PCM and PRA. It covered aspects related to:

- Day-to-day operations of an extension officer in working with farmers in groups with emphasis on the provision of information and feedback;
- Situation analysis including on-farm as well as off-farm opportunities and constraints
- Identification of problems, their causes and potential solutions;
- Clear statements of what actions can be taken to solve the more important problems identified;
- Use of marketing principles required in determining needs of a community;
- Development of advisory and information inputs to meet needs; and
- Method of data collection and report writing.

Gender issues were also lectured in the course.

Nineteen out of the 21 attendants said they were taking a course in community development for the first time, while two said they took such a course in the past. In the questionnaire, though most said that they had acquired more new knowledge and skill than expected in the course that they thought they were very much related to their job, they found it fairly difficult or even very difficult, considering the short time allocated to cover such a big volume of material. Here also, discussion between groups, the practical sessions, including talks on the results of the Farm Interview Survey and the Gender Issues were rated the most positive aspects of the course.

4.4.4 Achievement of Objective of Project and Outputs

(1) Project Purpose: Enable extension officers to train farmers better so as to increase the number of farmers who consult the extension officers

- Farmers' visiting number to extension officers has become more than double (zero to once a week before and twice to three times a week nowadays), and the achievement rate is 100% to the indicator of 20%.
- One VAEO makes good use of the training result, encouraging the farmers always even when they encounter the hardship of project implementation.

(2) Output 1: Extension officers improve technological knowledge on horticulture

- The paper examination conducted after the training showed more than 95% of correct answer rate. Most extension officers understood horticulture technology in the trainings, and the achievement rate is 100% to the indicator of 80%.
- The horticulture manual, including technological packages and impact points on major

productive crops in the Region, has contributed to the improvement and strengthening of on-farm activities.

(3) Output 2: Extension officers get advanced information on community-based development and extension methodology

- The paper examination conducted after the training showed 63% of correct answer rate. Extension officers understood advanced information on community-based development and extension methodology in the trainings, and the achievement rate is 79% to the indicator of 80%.
- Extension officers have been trained in community-based development and extension methodology using tools of participatory development approach such as PCM and PRA.

4.4.5 Evaluation

The final evaluation paying attention to the five evaluation criteria, i.e., efficiency, effectiveness, impact, relevance and sustainability, was carried out in October 2003, and the evaluation workshop was held on the basis of the Report for Final Evaluation Workshop attached in Attachment. The main parts of the report are given hereinafter by each criterion.

(1) Efficiency

As a result of the activities carried out with a proper use of input, the expected outputs have been achieved, namely, the extension officers have improved technological knowledge on horticulture and got advanced information on community-based development and extension methodology.

- Extension officers' training for the project had been completed. It is observed that input was efficiently converted to Outputs. Furthermore, timing and quantity of input were mostly appropriate.
- As most Extension officers had basic training only in agriculture and not in horticulture, the trainings and the manuals provided have improved their current knowledge in horticulture.
- The daily record book edited to monitor extension activities has given information on the number of people whom extension officers meet at any particular day, where the problems discussed about, the solutions proposed, etc. It has been used as a valuable tool in project monitoring.
- The horticultural manual, including, apart from the technical information described above, some extension methods on how to deliver effectively this information to farmers, has contributed to improving and strengthening their daily field activities.

(2) Effectiveness

As a result of the outputs achieved, the extension officers has become able to train farmers better so as to increase the number of farmers who consult the extension officers. Therefore, the Project Purpose is achieved.

- This purpose has been achieved with the training of extension officers empowering them to give more advanced knowledge to farmers more effectively. With the making of a curriculum to teach the extension officers, a horticultural manual and a daily record book, on-farm training has been strengthened, and farmers have been provided with better horticultural production means.
- The district officers have effectively developed on-farm training manual, which is to be distributed to the extension officers for on-farm training.
- Farmers' visiting number to extension officers becomes more than double.

(3) Impact

Positive impacts on the horticultural development such as vitalisation of extension officers' activities, effect to the farmers outside the project, and so forth, are given. On the other hand, negative impact as decrease of visiting number to other areas appeared.

- It is observed that farmers' reliance to extension officers increased. Most of them want to get technological information.
- The farmers outside the project have come to consult the extension officers more often than before.
- Farmers' visiting number to extension officers increased more than twice as much as before in the project area. This means less visiting times to other areas for extension officers. Each micro project expects the role of extension officers, which permit them to concentrate into the Study.

(4) Relevance

The Project Purpose of the programme is relevant, judging from the relating government policies and farmers' needs.

- The project purpose coordinates with agricultural development policy of Tanzania.
- Capacity building for extension officers was included in the DADP of all districts of the Study area
- Each district has the intension to train farmers using extension officers as lecturers.
- Farmers' needs are to consult the extension officers more frequently.

(5) Sustainability

Provided that the budget for this project is secured, it is sustainable.

- Capacity building for extension officers was included in the DADP of all the districts the Study area.
- The curriculum for training extension officers is to be continuously used when District gets budget for extension officers training.
- It is confirmed by DALDO that there will be no critical change of extension officers.

4.4.6 Analysis and Lessons Learned

(1) Favourable Outputs

There are several favourable outputs that have been taken by the members concerning this micro project. The significant outputs derived from the implementation are summarised below.

- As most of the trainees did not have any experience on horticulture nor community development, they got a fresh stimulation from it. They got additional knowledge on these fields that were quite relevant to their area of involvement. Since the course, especially in horticulture technology, was carried out in a participatory manner, everybody enjoyed presenting his or her opinions freely.
- Community development course was rather difficult for the first year with a large amount of new materials delivered to the trainees in too short a period. Consequently, only 57% of trainees passed the exam. The second year the lecturer made a review of the first year training until everybody understood it. The third year seems to have been an easy ride, as all trainees gave a good evaluation of the course and their understanding of it. Although it cannot be said that the trainees have got enough knowledge on this field, they understand at least what they had learnt at the training prepared under this Study.
- Extension officers have become more energetic than before as farmers rely more on them.

The implementation of this micro project has brought about the improvement of the extension officers' capacity. As a result, they became able to give the support to the farmers who were engaged in other pilot projects in technical matters and advancing participatory development, and it contributed to success of such projects with positive interaction among them. Therefore, this micro project shall be included in the Master Programme, provided that the following lessons learned shall be taken into consideration for this implementation.

(2) Budget

Most DALDOs agreed that the extension officers' training were very effective, however, the situation does not yet allow them to allocate a budget for the next training. Normally, the budget of District is too small to continue the training. On the other hand, provision of transport means, especially fuel for motorcycle, necessary for the daily extension work is inadequate, and the extension officers cannot make good use of the result of this project. Lack of budget for extension activities is a major bottleneck in many developing countries. Measures to solve such a problem should be implemented systematically. In the Master Programme, this issue is to be mentioned in the Recommendation.

(3) Lack of advice in Community Development

Though training in community development was given to help extension officers to build up their capacities in handling community matters, a lack of supervision was observed in some cases where communities could not handle accounting problems properly and few money mismanagement were reported. For the cases observed, the extension officers concentrated more in giving technical advices rather than supervising community activities. Equal weight has to be given for both activities. This

issue shall be taken into consideration when this project will be implemented.

(4) Contents of Training

It shall be considered a large amount of new materials shall not be delivered to the trainees in a short course. Training curriculum should be planned in accordance with the length of the course.

4.5 Process and Evaluation: Capacity Building for Community

4.5.1 Project Design Matrix

The Project Design Matrix of Capacity Building for Community is shown in the Attachment. The following is a summary.

Overall Goal	* Participatory capacity building programme on M/P is conducted to other areas.
Project Purpose	* Farmers find group activities and training programme meaningful.
Output	1 Community obtains know-how of group management. 2 Trained farmers become more conversant with horticultural production techniques. 3 Farmers promote group activities by using community facilities.
Activities	(Training for group leader) 1 Group leaders take training 1-1 Leaders from each component form Community Project Management Unit (CPMU). 1-2 Leaders of each group take a training course. 1-3 CPMU holds periodical meetings for information exchange at the district level. 1-4 CPMU makes necessary documents for group management. (Farmers' training) 2 Farmers take training 2-1 Farmers visit advanced horticulture area. 2-2 Farmers report the visit of advanced area. (Group formation) 3a Farmers perform group activities with multi-purpose shed they constructed 3a-1 Farmers organise shed management group. 3a-2 Shed management group plans construction of their shed. 3a-3 Shed management group draws up the rule of operation and maintenance. 3a-4 Villagers are involved in the construction. 3a-5 Shed management group provides examples of successful group activities so as to increase the number of users. 3b Farmers perform group activities through management of mill 3b-1 Farmers organise mill management group. 3b-2 The mill group draws up a rule of operation and maintenance. 3b-3 The mill group proceeds to construction and manages its operation and maintenance. 3b-4 The group members practice their work according to the rule they set up. 3b-5 The group members advertise the service to increase their profit.
Input	[JICA] Personnel 1) Leader (1) 2) Horticulturist (1) 3) Participatory (1) 4) Overseers (4) Equipment 1) Milling Machines 2) Engines Tools 1) Tools for training 2) Tools for construction Material 1) Material for training 2) Material for construction [Tanzania] Personnel 1) DSMS 2) Extension Officers Land

4.5.2 Process of Inputs

Most of the input was properly delivered in time, quantity and quality, and was used on schedule.

4.5.3 Process of Activities

(1) Activity 1: Group leaders take training

Activity 1-1: Leaders from each component form Community Project Management Unit

In order to coordinate several micro projects at a village, an organising body at village level that

consists of leaders of each micro project group need to be formed. In this project, it is named CPMU, Community Project Management Unit. The group leaders of each micro project were selected through voting among the villagers after several meetings for explaining the main idea of the project had been conducted.

At the target villages, CPMU is called KKM (Kamati ya Kuendisha Miradi) in Swahili that means Committee for Project Management. Members of CPMU Viziwaziwa coined this name in order to make it more familiar to the villagers. The other villages also agreed.

CPMU is supposed to have the function of 1) coordinating groups on different components, 2) monitoring activities of each component in a village, 3) setting a meeting for all the components, 4) supervising money flow from each micro project to CPMU or their bank account, 5) lending revolving money after the first loan was reimbursed, and so forth. Note taking in a meeting is also CPMU's duty. Note: Currently, the word, CPMU, has been used for identifying the whole members of the project at each village, and the group consisting of leaders of each micro project are now regarded as a board of CPMU.

Activity 1-2: Leaders of each group take a training course

Intensive training

Intensive training for group leader was conducted for three days in October 2001. The training consisted of two parts such as Community Development Skill for the first day and Accountant Skill for the following days. The numbers of participants were 42, 33 and 32 on the first, second and third days respectively. Contents of the training were as follows.

- Tasks of the group leaders in the project management
- Tasks of the secretaries and treasurers
- Project operation and management
- Public relations
- Purpose of a group discussion
- Basic knowledge in bookkeeping

Throughout the training period, village extension officers showed a close involvement with their villagers, coming with them to the training venue from their respective villages, securing accommodations adjacent to the venue and advising them whenever necessary during the sessions. The contents of the sessions were set to be relatively easy, considering farmers' level of understanding. A test in basic accounting skills was given in the third day. The results show that the extension officers scored more than 80%, while farmers scored around 60% on average. The extension officers are expected to provide technical support to their farmers.

Treasurer's OJT

After the intensive training mentioned above, almost all the members related to this project, except

Mkuranga district, were involving themselves in construction works of either Multi-purpose shed or Milling machine house, or both. During the construction, trainees who had taken the training course of accounting did not review what they had learnt. However, soon after the construction had finished, it became needed to recall their memory and brush the accounting skill up. To support that, an OJT by district staff was held at each village relating a milling business.

The OJT was started since February 2002, only at the village involving money transaction between the groups conducted such as Viziwaziwa, Mwanabwito and Vigama.

Activity 1-3: Group Leaders of CPMU hold periodical meetings for information exchange at the district level

Group leaders are promoters of each micro project. They must bring about incentive in promoting interchange of information, ideas or experience, which is essential for the successful implementation of the project. The periodical meetings consisting of group discussions contribute to solving the problems and advising group members.

The meetings were held five times so far, and were in February, June and November 2002 and July and October 2003. The leaders presented the current situation and its problems concerning each micro project. They took a key role in the meetings, frankly giving their opinions on the project and proposing what to do next.

Activity 1-4: CPMU makes necessary document for group management

Making a Constitution

CPMU takes an important role in organising all the micro projects at a village. It is necessary for CPMU, as an umbrella group, to have a constitution in order to govern the groups under CPMU. The first document needed for group management is a constitution that stands over each group's regulation. The following chart shows an example of organisation chart. Each CPMU shall have this kind of organisation structure for this project.

CPMUs have formulated its constitution in all villages. CPMU Viziwaziwa already applied their official registration with the constitution to the Ministry of Home Affairs as a self-help group, and got a certificate of registration in November 2001. Consequently, CPMU Viziwaziwa opened a bank account in September 2002.

CPMU Ruvu Darajani also registered to the Ministry of Cooperative and Marketing and opened its bank account in September 2003.

CPMU Vigama opened its bank account in June 2003 without making official registration.

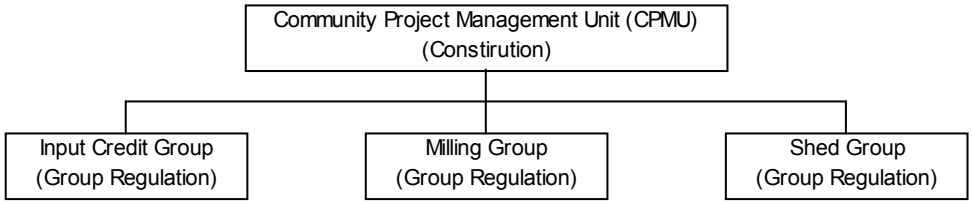

Fig. 4.5.1 Organisation of CPMU

Preparing monthly reports of their activities

CPMU is playing a leading role for Participatory Monitoring and Evaluation at village level. It is very important for District staffs to know the situation of components done in each CPMU in order to give members appropriate advices, which make the project more sustainable. However, it is not easy and manageable for district staffs to go to the villages and collect information about their activities. Therefore, a system of monitoring the project was proposed under which information could be collected by the members and sent to the corresponding district offices.

CPMU shall prepare the monthly report consisting of all activities done in the micro projects in accordance with the system. Each micro project group shall fill the forms and submit them to CPMU every month. The monthly reports shall be used at DPMC meeting.

(2) Activity 2: Farmers take training

Activity 2-1: Farmers visit advanced horticultural area

The farmers' trainings were conducted in the year 2001 and 2002, and they were three days trips outside Coast Region. Farmers were taken to advanced horticultural area to facilitate the interchange of ideas between them and more advanced farmers and stimulated their predisposition to better production techniques of horticultural crops. It was also expected that those who benefited from the trip would widely spread their experience to others in their villages, promoting more incentive for better horticultural production.

For the year 2001, trainees were selected from among predominantly vegetable growers and involved 50 trainees from Kibaha District in November and 50 trainees from Bagamoyo District in December. The trainings were carried out at MATI (Ministry Agriculture Training Institute) in Tengeru, Arusha. The farmers visited some successful farmers around Arusha as well as several agricultural facilities, and many of them bought seeds from the farmers, which they said they would try in their fields. Farm visit was followed by a brief tour at Arusha central market. Evaluation of the trip was carried out at night at the Institute, which was followed by filling out the questionnaires.

For the year 2002, trainees were selected from among predominantly fruit growers and involved 50 trainees each from Kisarawe, Mkuranga and Rufiji districts in July. The trainings were carried out at SUA (Sokoine University of Agriculture) in Morogoro. Morogoro was selected, as advanced fruit planting was practiced there and the trainees could take a lecture and stay nights at SUA. The farmers

made a trip in and around Morogoro and visited the farmers with advanced cultivation method. They also visited SCSRD (SUA Centre for Sustainable Rural Development) project site that is supported by JICA.

All activities were done almost as scheduled. Effect of the trainings has appeared little by little that the farmers started cultivating new varieties of vegetables spontaneously, introducing new method such as contour farming using A-Frame and contacting several sources of agricultural knowledge.

Activity 2-2: Farmers report the visit of advanced horticultural area

The farmers who attended the training prepared the reports. Judging the content of what they wrote in the report, they were greatly impressed with the advanced horticulture husbandry, such as cultivation using improved varieties, cultivation based on the collected market information, and so forth, and keen to practise it. They were also obliged to hand their acquired knowledge over to other farmers who could not take part in it. Soon after coming back to villages, the farmers hold a meeting where many non-project members listened seriously to the farmers back from the training area.

It was observed that one group with 25 farmers was formed outside project area (Kisarawe village) after knowing that they could get technical advice from extension officers who were managing the project group. Now they are cultivating vegetables and preparing for seedling production, which is without assistance from the Team.

(3) Activity 3a: Farmers perform group activities with multi-purpose shed they constructed

Activity 3a-1: Farmers organise shed management group

The shed group cannot expect a large amount of income from their activity, as the shed does not generate much income. What the group will do would be to maintain the facility for the community as a whole and lend its space to someone for a small charge. Farmers understood that this activity involved volunteer work for the community.

A group was formed at each village in March 2001. At two villages, namely Viziwaziwa and Ruvu Darajani, the villagers who are involved in other micro projects such as Input Credit and Pump became in charge of management of the shed. At Vigama, a shed management group was formed with members who are not involved in any other micro projects.

Women's dropout from the group was observed often, because they 1) marry someone outside village, 2) move to a city for seeking a job and 3) become pregnant or sick.

Activity 3a-2: Shed management group plans construction of their shed

Although there were some differences between villages on its use, all three villages have thought it to become a centre of village's development. The members had recognised importance of making a plan

of construction, since the construction of shed required a lot of labour and time. So this activity smoothly proceeded. The groups at each village made a working plan of construction which showed who worked on which days from what time, and so forth. With assistance from other villagers who were not directly involved in the project, the tough work was completed. Other than the shed, as requested by farmers, the Team has supplied some materials for construction of toilet.

The area and function of the multipurpose shed is shown in the following table, and the layout of the multi-purpose shed is shown in the following chart.

Table 4.5.1 Area and Function of Multi-purpose Shed

	Area for All	Function for Viziwaziwa	Function for Vigama	Function for Ruvu Darajani
Total	12 m x 6 m =72 m^2			
Office	4 m x 3 m = 12 m^2	For storage of daily commodities, remaining construction materials, agricultural input and product	For office works of managements of CPMU, Multipurpose shed, Milling machine, Nursery group	For office works of managements of CPMU, Multipurpose shed, Pump groups
Store Room	4 m x 3 m = 12 m^2	For office works of managements of CPMU, Input credit, Multipurpose shed, Milling machine, Pump groups	For storage of daily commodities, remaining construction materials, agricultural input and product	For storage of daily commodities, remaining construction materials, agricultural input and product
Multipurpose Space	8 m x 6 m = 48 m^2	For meeting, special occasions such as wedding, funeral, cerebration, party	For meeting, market place	For meeting, market place

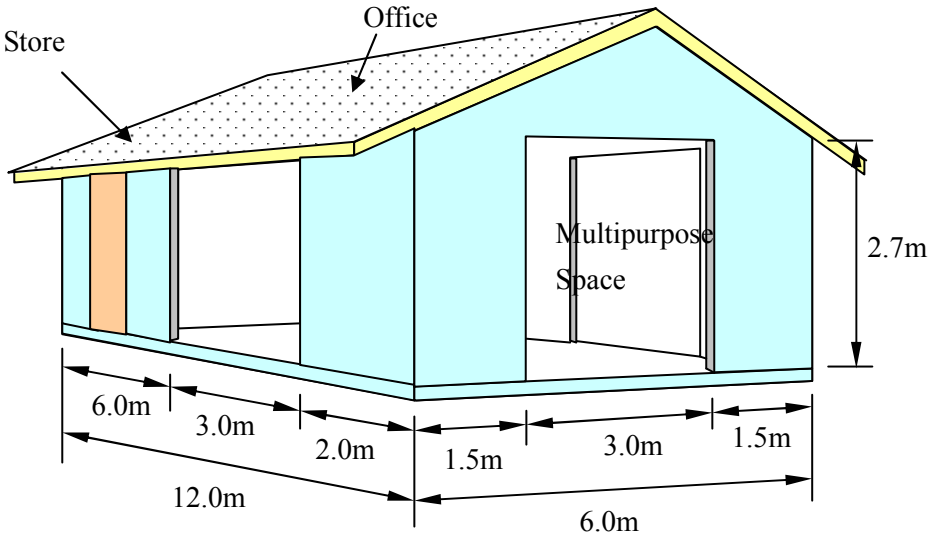

Fig. 4.5.2 Layout of Multi-purpose Shed

Activity 3a-3: Shed management group draws up the rule of operation and maintenance

The rule of operation and maintenance is important to avoid serious problems caused by a lack of group regulation.

This activity was planned to finish before construction, but only rough ideas were prepared at that time. The ideas included only general matters, and did not mention specific figures such as how much the contribution fee should be, how much the charge of using the shed should be and how often the meeting of the shed management group should be held. In February 2002, after construction was done, the management groups at the three villages started revising their rules. Some of such specific figures were decided. However, a problem was that the members were not completely following it and also the leaders could not practise disciplinary measures on members who did not follow it.

Activity 3a-4: Villagers are involved in the construction

The construction of the shed was started in October 2001 and completed in February 2002. However, it was not easy to make the villagers contribute themselves for the construction. The management group and CPMU tried to persuade them, but sometimes only few members came to the site and worked. It was because the construction started in busy season on farms. At first, the construction was planned to commence in July 2001 when farming activities were not so busy. But due to late preparation, all work delayed. Above all, the construction took them more than four months.

In order to advance smooth construction, there was a case that CPMU members paid some amount of money to employ villagers other than the members as construction labour. Additionally, in another case, the members paid for transport for sand and land acquisition that the Team did not provide them with.

Activity 3a-5：Shed management group provides examples of successful group activities so as to increase the number of users

This activity was planned in order to increase the number of users of the shed in the villages. Actually, there were many plans that they had made before the construction of the shed such as using the shed as a market, a theatre and a meeting place. But they realised that the plans could not be implemented as planned.

Under such circumstances, there were several actions made by the shed group in order to use the shed lively. The shed has been used for all the meetings of this project at all the sites. Especially in Viziwaziwa, periodical meetings for Input Credit were conducted under the shed every week. In Ruvu Darajani, all the project members and the village government hold monthly meetings at the shed. In Vigama, the groups of mill and shed have monthly meetings.

The shed has been used for not only meeting or selling their produce, but also for educational and cultural activities in community such as a library, seminar, theatre and wedding ceremony.

In each village of Viziwaziwa, Vigama and Ruvu Darajani, the shed has been used as a library where many kinds of books brought by the Team are kept. The shed group members drew up a book list and managed lending the books.

Viziwaziwa held a play performed by Kibaha Youth Centre in July 2003. Kibaha Youth Centre is composed of about 15 boys and girls in Viziwaziwa and tours one village after another in Kibaha district.
One couple in Viziwaziwa had a wedding ceremony under the shed at the beginning of 2003.

In Ruvu Darajani, a seminar on health is held at the multi-purpose shed on "Village Health Day" which comes every three months. NGO named "CSPD" under the Ministry of Health conducts the seminar for village leaders around Ruvu Darajani.

(4) Activity 3b: Farmers perform group activities through management of mill

Activity 3b-1: Farmers organise a milling machine management group

A group was formed at each targeted village in July and August 2001, through several meetings with officers from the Region and district. Women's participation was promoted since they know better about the hardship of milling maize by hand and also problems of bringing maize to town where a mill was located. Generating money from milling business is not the first priority. The most important objectives are knowing the importance of group activities, and reducing women's work to secure more time for working productively.

It was observed that some group members changed because of their poor attendance at group activities due to sickness or laziness. During several workshops, the groups at all the villages discussed about making rules regarding absentees of meetings. These rules were included in the CPMU constitution. In fact, the constitution has been applied in some occasions to replace or remove a member who has shown poor attendance.

Women's dropout was observed in Mwanabwito not because of poor attendance, but related to family affairs such as husband's dissent and children's sickness. In order not to face this kind of problems, opinions from husbands of female members were considered from the beginning of this component, and the husband's participation was encouraged and their consent was secured as much as possible. However, some of the husbands changed their mind, so that some women had to leave the group.

Activity 3b-2: The group draws up a rule of operation and maintenance

It is necessary for the group to draw up group's regulation in order to strengthen group's solidarity and to avoid any possible conflict among its members.

The members discussed roles and responsibility of each member, time for operation, materials required, and so forth to draw up the rule. Subsequently, they revised their rules in order to make it

more concrete and help them implement their working schedule smoothly. Their rules included several articles regarding membership, leadership, money distribution, discipline and types of meeting. In addition to that, they made a working shift with a rotation system.

Activity 3b-3: The mill group proceed to construction and manage its operation and maintenance

The construction of the house for the machine was started in October 2001 and completed in February 2002. It took them about four months that were more than they planned. It was due to the same reason mentioned in the "Activity 3a-4". After construction and preparation of foundation, machines and engines were installed. Instead of choosing imported ones, the machines made locally were selected, which were brought from Morogoro, taking into consideration availability of their spare parts. The engines were also selected locally, which were from Dar es Salaam.

The area and function of the mill house is shown in the following table, and the layout of the mill house is shown in the following chart.

Table 4.5.2 Area and Function of Mill House

	Area	Function
Total	3.5 m x 7 m = 24.5 m^2	
Store Room	1.5 m x 1 m = 1.5 m^2	To store fuel, lubricates, equipment
Machine Space	3.5 m x 7 m - 1.5 m^2 = 23 m^2	To accommodate; Milling Machine + 8HP Diesel Engine Husking Machine + 16HP Diesel Engine

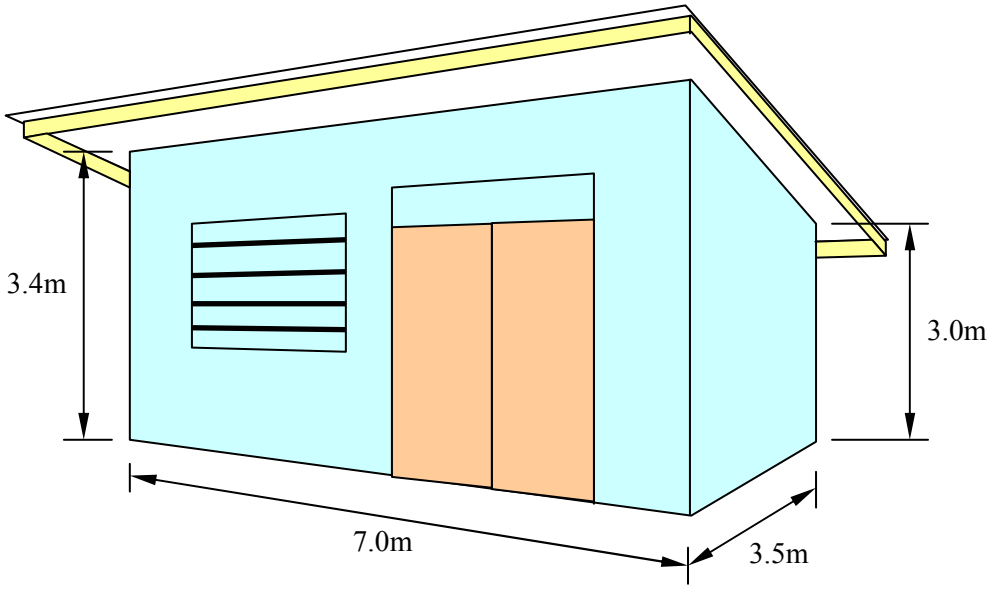

Fig. 4.5.3 Layout of Mill House

Activity 3b-4：The group members practice their work according to the rule they set up

The machines installed showed many troubles. The engines also had frequent minor problems. Since

this situation was observed from the beginning, the cost of repair was born by the Team for smooth taking off the project. It was agreed between the leaders of the mill groups at each site that the main troubles concerning the machines and engines themselves were fixed and the leaders would take the responsibility for machines and engines in July 2002.

In Viziwaziwa, customers were very few, because of low production around the village due to the severe flood in April 2002. Although they prepared a working shift, not all the members followed the shift because the members did not want to waste time for few customers. Only one old man was working instead. The customers sometimes brought not maize but cassava which had not been expected much at the planning stage.

The engine of the husking machine at Viziwaziwa was out of order since September 2002, just after the responsibility was shifted to them. Since then, the members were just waiting for someone to repair it without doing anything by themselves. Also they were expecting the Team to solve the problems as the Team used to financially support them for repairing.

The machines at Vigama worked well without any major problems from December 2002. Minor problems with machines sometimes occurred. However a technician who was also a member of mill group have managed them. All the mill members seemed very comfortable and confident with their roles.

In Mwanabwito, there were many customers. So the members followed the working shift that they made in order to serve customers who sometimes form a queue. However, the severe drought halted the operation due to lack of customers in 2003.

The necessary accounting documents such as a cashbook, a payment voucher, a receipt voucher, and so forth have been recorded duly and almost thoroughly well in all the villages. It seems that such transaction is done well since they have started dealing with their money.

Activity 3b-5：The group members advertise the service in order to increase their profit

In Mwanabwito, nearly 300 customers on average per month (at the peak, it was 523 customers in May 2002) came to the machine for milling and also husking, although the milling machine group did not put much effort to attract customers. In Viziwaziwa and Vigama, on the other hand, they faced the problem of few customers of only less than 60 per month on average.

Advertising their activities to villagers around was vital for the members of Vigama and Viziwaziwa, since they faced the problems of few customers. In Vigama, the members prepared signboard with the logo mark that they contrived together.

In Mwanabwito, the members informed villagers living farther interior in order to continuously draw

customers and seek new ones. As a result, the machine even served people outside Mwanabwito.

4.5.4 Achievement of Objective of Project and Outputs

(1) Project Purpose: Farmers find group activities and training programme meaningful

- The farmers who attended the training have became more demanding of horticulture technique. All extension officers replied that frequency of visit to farmers concerned dramatically increased. According to the interview on the final evaluation, the rate of increase in number of visit is over 100%, which is rather higher than 50%, the rate initially set.
- Farmers involved in this project showed their effort to make the group activity sustainable. The group activities such as Milling machine and Multi-purpose shed proceeded to the stage of operation. They got stuck with some machine troubles, but except that, almost all activities showed progress. All project members replied that the facilities are continuously used and they have a will to do so.
- It was reported that several new activities occurred through their own initiative and expenses. However, some are not active now and others are active but not profitable enough.

(2) Output 1: Community obtains know-how of group management

Achieving necessary note taking or documentations by CPMU for sustaining each project was sought as initial output of this component. Among the 7 villages, except one, almost all required documents prepared, such as group regulations, cashbook, minutes of meeting, and so forth by them were discerned.

(3) Output 2: Trained farmers become more conversant with horticultural production techniques

All the trained farmers in this Study have admitted efficacy of the training and stated that they would join in next training if available. The farmers now give advice on cropping techniques to other farmers through their daily farming activities.

(4) Output 3: Farmers promote group activities by using community facilities

According to the interviews to 55 project farmers for the final evaluation, 78% of them said that most activities related to the multipurpose sheds were on schedule, although there were some delays at several stages of the process from planning, construction to utilisation. With the shed as a meeting place, changes were given to group members to discuss among themselves. Furthermore, some groups were able to start diversifying their activities using the facilities, such as rice storage business by the milling machine group in Mwanabwito and also input credit management by the pump group in Ruvu Darajani.

4.5.5 Evaluation

The final evaluation paying attention to the five evaluation criteria, i.e., efficiency, effectiveness, impact, relevance and sustainability, was carried out in October 2003. The evaluation results are given hereinafter by each criterion.

1 Efficiency

In spite of some delay, planned materials and personnel were introduced to this component as scheduled. With the high commitment of farmers, all materials have been utilised in any form. By reviewing the extent of achievement of the outputs, the efficiency of the programme can be said high.

-Training

- Villagers are keeping records of their activities and also memos of what they learned in the training sessions they had. Inputs needed for record keeping in the training are a number of training materials and some stationery, which were delivered as planned. Since participatory monitoring system was applied for this project, time consumed for this training was rather long. Otherwise the system would have not worked. Records prepared by them became more informative and useful for monitoring. CPMU members at each site agreed that the record prepared by them monthly was to be submitted to DPMC for monitoring purposes. This training was worthwhile.
- The training on agricultural technique drastically triggered farmers' interests in vegetable and fruit cultivation after joining the study tour. Their satisfaction was shown in a way that they highly demand another training for horticulture. This was also supplemented by the training of Extension officers which have given the officers confidence of advising farmers. Input for the training in both group management for leaders and agricultural technique for farmers were delivered as planned, and judged appropriate by almost all participants.

-Multi-purpose Shed

- Input not available at village were delivered to each site not on time due to late start of the project as a whole. Farmers provided casual labour.
- The construction was designed to be implemented during the dry season when farmers were not intensively engaged in farm activities. But the start of actual construction delayed. This might have led to longer construction time. The materials used for construction were modern. Therefore, they have somehow attracted villagers to be active.
- As many farmers noted, a sense of co-operation was obtained through the construction, which contributed to the cohesion of the groups that participated, as compared to the ones that did not join the construction.

-Milling Machine

- The machines and engines installed showed many troubles of mechanical problems. And they could not work as much as specified. The selection of machine should have been done more carefully.

- All the villages made schedule and tried to follow it. Such spontaneous activities are the expected output on this component.

2 Effectiveness

Newly introduced agricultural techniques and the facilities constructed have been used. Accordingly, these outputs derived from this programme have given a positive influence on farmers' real life. Therefore, it can be said that farmers concerned understand enough the effectiveness of the programme.

-Training

- Since farmers became more active in horticulture, and agricultural officers improved their knowledge, farmers' contact with the officers and other sources of knowledge were increasing. Not only farmers waited for the officers but also went to see them.

-Multi-purpose Shed

- Almost all farmers noticed the importance of the shed that was used effectively as a motive for development. For example, the shed was used for meeting, kiosk, wedding and so forth.

-Milling Machine

- The members noticed that working together in a group could help solving some difficulties.
- A reduction of time to walk to neighbouring village for milling was achieved. By so doing, time saved was allocated more to their fieldwork and housework.

3 Impact

There are many examples that illustrate good interaction between project members and non members. These are not only inside a village, but also between villages.

-Training

- As DPMC was contributing to information exchange on horticultural cultivation, leaders who attended DPMC or Joint-DPMC meetings delivered the knowledge exchanged to each village.
- For farmers who attended the training, the responsibility to disseminate the acquired knowledge to other members who did not attend, was broadly taken. The effect was seen in that new varieties of vegetables and some new methods such as contour making by A-frame started to be introduced in several villages.
- The micro projects such as experiments of vegetable and cropping under Input Credit also contributed to technical transfer to farmers outside the projects.

-Multi-purpose Shed

- Some villagers have already moved their house near the shed, since they are aware that the place of the shed will be the centre of the village.
- The villagers in Mwanabwito constructed their own multi-purpose shed next to the mill, recognising its convenience seeing other villages' shed. Even though the material used was not

concrete but soil and branches that were traditional there, the shed was still shining.

-Milling Machine

- Not all but almost all the members were accustomed to working with schedule, knowing the importance of note taking and strict account management.
- Near Mwanabwito, there was one milling machine business that started after knowing that it was lucrative since the work by the project group had been successful somehow. This is one good influence given to farmers outside the project.

4 Relevance

This programme is in line with farmers' needs, at the same time with the national policy promoting demand driven development.

-Training

- All the farmers who joined the training are very keen to join in a next training, if there is one. This shows farmers' demand on such trainings is very high.

-Multi-purpose Shed

- This micro project facilitates discussion among stakeholders within a village, which supports the approach of rural development of the nation.
- Farmers' needs are high and the offices were used very often.

-Milling Machine

- Sixty per cent of 55 farmers interviewed in the villages concerned replied they came to mill as a customer "often" and "very often". Both men and women really appreciated, especially in Mwanabwito, the installation since it helped them reduce time for milling. Therefore, farmers' needs are very high.
- This micro project is suitable for giving farmers a chance to feel the importance of group activities since the milling machine business involve quite many kind of tasks and also frequent money transactions.

5 Sustainability

This programme aimed to empower farmers in order for them to start new and sustainable activities. During this study period, some new ventures actually started and are still trying to strive. This is what exactly the programme meant. Sustainability of the programme itself depends on the country's effort to allocate a budget for it.

-Training

- Since the Government has also put higher priority on such training, it is holding some of them for farmers using its own budget, which shows its relatively high intention. The budget can also be allocated relatively quickly. Instead of Arusha or Morogoro, Zegereni farm can be a low-cost

training place for the farmers in this Region.

-Multi-purpose Shed

- The example of Mwanabwito shows that the farmers have constructed their own shed.
- As far as the place is carefully considered, a shed seems to work as a drive for development to the villagers. If further success from this study takes place, replicating this component can be possible.

-Milling Machine

- It is difficult to judge how long the machine can last with minor repairs, but taking Mwanabwito as example, the group could make high earnings in 2002 following a good year of high crop production despite high running costs. Their operation can be sustained given continuous agricultural extension service and follow up together with favourable weather. However, the choice of machine should be done with great care. The other villages with scarce customers even have sustainability, as long as income can cover expenses, in the aspect of tools for promoting group activities.

4.5.6 Analysis and Lessons Learned

(1) Favourable Outputs

There are several favourable outputs concerning this component that are summarized as below.

a. Leader Training

The group leader training has brought out good leadership and good governance of CPMU, as follows:

- Documents were continuously kept somehow spontaneously.
- Almost all activities were done on self-help bases.
- All the villages made schedule and tried to follow it.
- CPMU spontaneously held regular meetings and discussed what to do and how to improve the project, resulting in improvement of their capacity.

The secretary of CPMU in Ruvu Darajani prepared a calendar of annual farm activities' since 2001. They were very helpful especially for the pump group members who needed to make repayment schedule. He said that he had learned how to prepare it through Training for group leader as one of the micro-projects conducted.

The procedure taken for solving the problems became democratic. CPMU in Ruvu Darajani took all the procedures through meetings and official letters. The members of the CPMU issued more than 30 letters for both internal and external matters. And those have been kept in their file. Their transaction is very informative for other villages' CPMU.

b. Farmers Training

The farmers' training has stimulated many farmers. Taking farmers to more advanced areas of horticultural production have motivated most of them to do better for themselves and for the village as described bellow.

- Some brought seeds from these areas to try them on their fields and recorded good success.
- Some were inspired and learned that it was possible to get stable earnings from small farmland only by watering using Kisima with limited water without depending much on rain, and they started to do so.
- Groups were formed on their own initiative in areas outside the project areas because the training inspired farmers of these areas.
- Leaders delivered the knowledge learned to each village.

c. Multi-purpose Shed

The multi-purpose shed is a symbol for village development. It has the following favourable output.

- All farmers see the shed as a real need for village development. It provided the village with some status and promoted group cohesiveness providing a permanent meeting place protected from sun as well as rain, office and storage place for keeping group properties.

d. Milling machine

The micro project of the milling machine is a tool of capacity building for community development. In that sense the milling machine has performed well. The villagers concerned declared good impacts of the milling machine, as follows.

- The machine acted as a tool promoting group cohesiveness, as group members managed to work in-group.
- The milling machine increased good cooperation between villages providing the services and nearby villages receiving it.
- The milling services available at the village premised saved time for the farmers especially women who could allocate longer time for their fieldwork and housework. Introduction of the milling machine also reduced workload for women. It took more than 2 hours to milling at Viziwaziwa, 6 hours at Mwanabwito and 4 hours at Vigama before the milling machine was introduced.
- De-husked by-products can be used as animal feeds, prompting the number of local chicken keepers to increase.

From the results of the continuous monitoring, mid-term evaluation and final evaluation survey, the following lessons were revealed. This will be reflected into the Master Programme to make it more feasible.

(2) Procedure of Training

Training is very important in community based projects. Training, especially farmers' training, can

stimulate all other activities of other components. It is observed that the positive interaction between various micro projects such as Training, Input Credit and Improved Watering can influence success.

The successful points of the farmers' training are as follows.

- To meet the developed farmers and discuss with them at the site would give clear idea to farmers.
- To accommodate farmers together few days would bring close fellowship.
- To select participants from both group members and non-members would support sustainability of other micro projects.
- To let participants talk about their findings to other villagers could expand the activities of micro projects to non-target villagers voluntarily.
- To find much nearer and much more similar place to the Region considering the cost of travel.

(3) Observance of group regulation

More time should be given for sensitising the members in order to make them follow the regulation.

All villages except Viziwaziwa and Ruvu Darajani have not completed their registration. Though members have declared following the regulations, some ill effects were recorded in the workshops, such as;

- Poor attendances in meetings have made.
- Mwendapole has not met the requirement of record writing due to the negligence of the secretary.

In fact, controlling group members by group regulation does not necessarily depend on whether the group is already registered or not. However, when the group is registered and becomes a legal entity, it can take legal actions against one who does not observe the rules. But, at any villages, the power balance between villagers is so sensitive that one often avoids creating problems on such matter. This is the way order is kept in the villages. More time should be given for sensitising villagers.

(4) Place and Use of multi purpose shed

When selecting the location of the shed for a market place, more detail survey should be conducted.

The following problems were raised in the final evaluation workshop.

- The plan made before construction has not yet completely materialised at any of the sites.
- At the beginning the shed was planned to be a market place. However, the sheds were used for market purpose only several times in Viziwaziwa and intermittently in Vigama. In Ruvu Darajani, although they are still keeping their plan of making their shed as a market centre with hundreds of small stalls surrounding it, it has not yet commenced.

There must be some reasons why a particular plan cannot work as they wish. When selecting the

location of the shed for a market place, make sure that easy access is guaranteed. Do not put the facilities in remote place away from the roadside where business may be looming. At least these have to be in place. More detail survey should be conducted for a better selection of place.

(5) Problems of milling machine

It is necessary to estimate needs of milling machine through the farmers including the neighbouring villages. In addition, it is essential to select the machines consulting with the beneficiaries and decide together on the type to buy. Moreover, the extension officers should make better use of their community development skills acquired during training to closely supervise financial activities of the groups to limit risk of embezzlement.

There were some problems with regard to estimation of needs, selection of machines and management of this micro project.

Needs

- The machines have not been bringing good results in terms of income generation except in Mwanabwito.

At the beginning of the project, the farmers proposed to introduce the milling machines in the workshops. They said there was a sufficient demand for the milling machines answering the Team's question. Accordingly, the Team confirmed if the yield of maize in the area is sufficient to the districts officers, and they answered positively. However, the machines did not bring good results in terms of income generation except in Mwanabwito.

For the project that is easily affected by the quantity of customers like this, sufficient study on the needs of milling machine, by means of questionnaire to the farmers including the neighbouring villages, shall be needed without believing straight what the farmers were saying. However, from the viewpoint of women's workload reduction and time saving, the farmers are still expressing its usefulness, and it can be said the needs are high.

Selection of machines

- The machines and engines installed have shown many troubles, and such frequent mechanical troubles have caused delay of smooth operation.

Faulty equipment may demoralise group and break group dynamics. It may affect group motivation. One should make sure that machines and equipment to be distributed in a project would function properly to avoid inconveniences and lack of trust from the recipients.

- Survey the area before buying machines to see what types of machines are used, what are the problems usually experienced by the machines, if any. Buy only good machines.
- Good machines dealers should be selected and equipment should be guaranteed and returned to the dealer if not satisfactory.
- Make sure that spared parts can be readily available in the local market.

- Ask the beneficiaries of the machine if they know of any maker that is better than other before deciding. If possible, consult with them and go with some representatives to the places where machines are sold and decide together on the type to buy.
- If a group identifies a problem with the machine, visit and make sure what the problem is. Do not leave everything at the hand of the engineer who may give other explanations than the real cause of the problem. Visit frequently the site to assess the working condition of the machine.

Management

- Although there were some money mal-handlings among group members, they were solved in the meetings among the members and the district officers by changing CPMU leaders.

In income generating activities such as milling machines operation, risks of funds mismanagement still exist. Extension officers should be urged to make better use of their community development skills acquired during training to closely supervise financial activities of the groups to limit risk of embezzlement.

4.6 Process and Evaluation: District Seedling Farm

4.6.1 Project Design Matrix

The Project Design Matrix (PDM) of the District Seedling Farm programme is attached in Annex, and summarised as follows.

Overall Goal	* District seedling farm Programme in the Master Programme is continuously implemented.
Project Purpose	* District offices develop human resources for the sustainable implementation of District Seedling Farm Programme.
Outputs	1 System to produce and distribute improved seedlings of fruit trees is formed well in Kibaha district. 2 Systems to guide farmers' groups in seedling production are formed well in Kisarawe and Mkuranga districts. 3 Extension systems in soil and water conservation techniques are formed in Kisarawe and Mkuranga districts. 4 Implementation system for vegetable cultivation tests is formed in Kibaha district.
Activities	1 Seedling production and distribution in Zegereni farm 1-1 Kibaha district establishes a seedling farm operation unit 1-2 Kibaha district establishes seedling farm in Zegereni with help of JICA 1-3 Kibaha Agriculture Office trains staffs of the seedling farm on improved technique to make seedlings 1-4 Zegereni farm produces improved seedlings with improved technique to make seedlings 1-5 Zegereni farm distributes improved seedlings to farmers 2 Seedling production in group nurseries in Kisarawe and Mkuranga 2-1 Farmers establish group nurseries in Vigama, Mwanambaya and Mkuranga 2-2 District Agriculture Offices demonstrate improved techniques for seedling production 2-3 Group nurseries produce improved seedlings with improved techniques 3 Soil and water conservation techniques in Kisarawe and Mkuranga 3-1 Farmers learn soil and water conservation techniques 3-2 Farmers prepare water bunds to plant seedlings 3-3 Farmers practice mulching for seedling planting 4 Experiments of vegetables in Kibaha 4-1 Kibaha Agriculture Office establishes branch experimental plots in Viziwaziwa and Mwanabwito 4-2 Zegereni farm and farmers of the plots conduct experiments on adaptability of new varieties/types of vegetables 4-3 Zegereni farm and farmers of the plots carry out fertiliser, insecticide and fungicide tests 4-4 Zegereni farm demonstrates new varieties/types of vegetables and the improved technique of vegetable cultivation
Inputs	[Japanese Side] Personnel (Study Team) Facilities and Equipments (Office, Storage, Bush house, Computer, Fax, Pick-up, Pump, Sprayer, Camera, Weighing scale, Soil test kit, Refrigerator, Office equipment, Faming tools, etc.) Farming Materials (Seedlings for mother trees, Fertiliser, Agro-chemicals, Seeds, Scions, Seedling Pots, etc.) Operation Cost (Salary, Wedge, Maintenance cost, fuel, training cost) [Tanzanian Side - District] Personnel (Farm staffs, Extension officers) Facilities and Equipments (Land, Water source, First aid kit) Farming Materials (Fertiliser, Agro-chemicals, Seedling pots, Rootstocks, Scions) Operation Cost (Utilities, etc.) [Tanzanian Side - Farmers] Personnel (Farmers, Groups) Facilities and Equipments (Land, Shed, Water source, Farming tools) Farming Materials (Fertiliser, Agro-chemicals, Seedling pots, Rootstocks, Scions) Operation Cost (Labour, Transportation, etc.)

The activities of No. 1, 2 and 4 in the PDM are the major parts of the original District Seedling Farm programme. The activity No. 3 regarding soil and water conservation is an additional part of the programme, which was revised from a part of Improvement of Watering in the course of implementation planning.

4.6.2 Process of Inputs

Quality of all inputs was reasonable and almost all were mobilised on schedule. Almost all necessary inputs were allotted in accordance with the Plan of Operations. Almost all inputs were used for the right purpose of the programme, as mentioned in the Plan of Operations.

4.6.3 Process of Activities

(1) Activity 1: Seedling production and distribution in Zegereni farm

Activity 1-1: Establish a seedling farm operation unit in Kibaha district

The operation unit of the seedling farm was established in the agricultural office of Kibaha district during the initial operation. Key persons of a Farm Manager and a Horticulturist were selected from experienced personnel and assigned properly for the farm operation. The VAEO of Zogowale village worked as an assistant. Other staffs were a driver, three watchmen, and necessary casual workers.

Activity 1-2: Establish seedling farm in Zegereni

The construction works were commenced by a local contractor at the beginning of October 2001 and completed in December 2001. Major items to be constructed in the 4 ha area were office building, bush house, vegetable plot, orchard, fence, and water facilities. The equipments, farming tools and production materials were procured in the early stage of the operation.

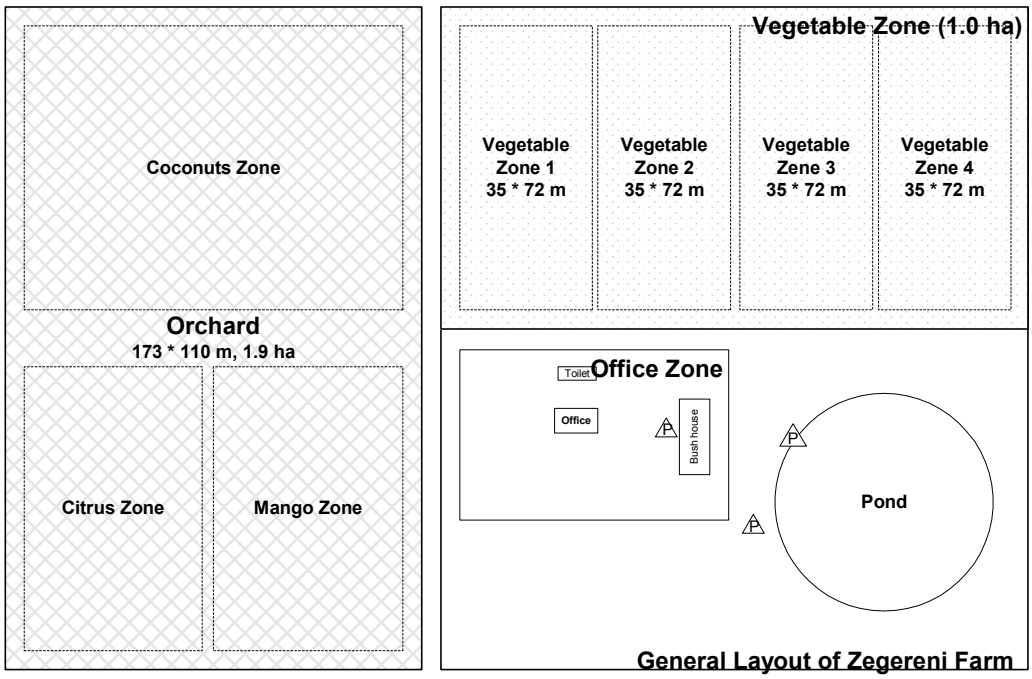

Fig. 4.6.1 General Layout of Zegereni Farm

Activity 1-3: Train staffs of the seedling farm on improved technique to make seedlings

The horticulturist carried out on-the-job training for the workers from October 2001. All workers taking care of the vegetable field and the orchard learned various techniques from the horticulturist and the farm manager. Some of them learned grafting techniques in July 2002. The farm manager and horticulturist also visited the developed farms belonging to public agencies to observe the situation of the farms and to learn farm management and horticultural technologies.

Activity 1-4: Produce improved seedlings with improved technique

The preparation of fruit seedlings started from the end of 2001 to achieve the target number of the seedling production. As for citrus seedlings, about 2,000 seedlings were prepared from October 2001. The budding of citrus was implemented on some 30 rootstocks in July, 350 in October, and 110 in November 2002. For the 2003 season, about 3,000 rough lemon seeds were sown at nursery beds in August 2002. The preparation of budded seedlings of citrus fruits was carried out continuously.

More than 2,500 of mango seeds were sown at the same place from December 2001. The grown rootstocks were grafted to the scions of the improved varieties from August 2002. The grafting was made using about 100 scions in August, 100 scions in October and 220 scions in November 2002. Although the potting soils mixed with cattle manure damaged the seedlings, the use of fertile forest soils made them recover in late 2003. The production of mango seedlings increased significantly for distribution in the next long rain season. Some 1,250 rootstocks of mangoes were under preparation for the next grafting.

Several thousand of coconut seeds, consisting of 3,000 East African Tall variety and 200 Malayan Red Dwarf variety, were planted in the farmland of Zegereni in March 2002. About 2,000 coconut seedlings were prepared for distribution in November 2002. .

In addition, some other tropical fruit seedlings, for example Soursop, Sweetsop, Jackfruit, Avocado and Breadnut were prepared. Some seeds of Rambutan were also sown in November 2003.

Activity 1-5: Distribute improved seedlings to farmers

The Zegereni farm distributed fruit seedlings to farmers and other customers directly or through district officers including VAEOs and WAEOs. The distribution of fruit seedlings from Zegereni farm was much smaller than the target. The total number of the distributed seedlings was still 860 as of October 2003, of which coconuts were dominant. The following chart shows the monthly sales of fruit seedlings by kind. About 2,000 coconut seedlings were ready for distribution, but many seedlings remained in the field due mainly to irregularly scarce rainfall in 2002 short rainy season and 2003 long rainy season.

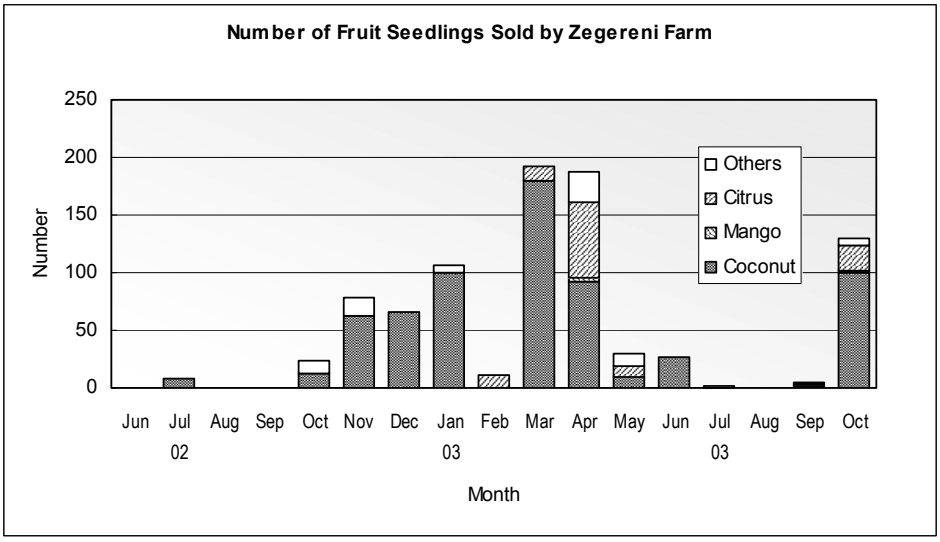

Fig. 4.6.2 Monthly Sales Record of Fruit Seedlings at Zegereni Farm

(2) Activity 2: Seedling production in group nurseries in Kisarawe and Mkuranga

Activity 2-1: Establish group nurseries in Vigama, Mwanambaya and Mkuranga

The groups of Mwanambaya and Mkuranga were activated in June 2001. The group members of Vigama were fixed in January 2002. The participants of this activity were 27 members of five groups in Vigama, 18 members of three groups in Mwanambaya, and 23 members of three groups in Mkuranga as of November 2003. Each group composed of four to eight members, had a chairperson, a secretary and a treasurer selected among them. Most of the group members had no experience of grafting or budding. The groups established their own rules (constitution) to manage and operate their organisation properly.

The JICA Study Team rented some tools necessary for the seedling production to the groups. The tools provided were watering cans, hand spray, insecticide, mask, secateurs, knives and so on.

Activity 2-2: Demonstrate improved techniques for seedling production

The district agriculture offices of Mkuranga and Kisarawe provided some technical instruction on mango grafting at the three sites in October to November 2001. Then, the technique of citrus budding was instructed to the groups of Mwanambaya and Mkuranga in July 2002. The district officers and extension officers concerned demonstrated the budding. At the instruction meeting, the member farmers learned and practiced the budding techniques.

Activity 2-3: Group nurseries produce improved seedlings with improved techniques

The group nursery in the villages started to produce high quality seedlings of mangoes and citrus. Grafting of mango started from November 2001, and budding of citrus was carried out in July 2002. The JICA Study Team provided the groups with the mango scions for seven times. The total number of scions was about 4,600. The varieties were Tommy Atkins, Kent, Apple and Keitt. These varieties were expected to generate higher income because of their early maturing (except Keitt: late maturing)

and the export quality of the fruits. The group members grafted all scions on the rootstocks of local varieties under the technical assistance of the extension officers.

As for citrus, about 2,600 buds of citrus were distributed to the groups of Mwanambaya and Mkuranga in three times from July 2002. The group members also budded them on the rootstocks of local varieties under the technical assistance of the extension officers.

Apart from the support by the Team, some groups carried out grafting of mango and budding of orange by their own resources. All groups prepared rootstocks of mangoes and citrus independently aiming at succeeding at the production of improved seedlings.

The group members planted some improved fruit seedlings in their fields to take grafting or budding material in the future. They also sold surplus to others and use the income for next operation.

(3) Activity 3: Soil and water conservation techniques in Kisarawe and Mkuranga

Activity 3-1: Teach farmers about soil and water conservation techniques

The Team provided the officers concerned with general explanation paper on soil and water conservation, which clearly describe the objectives, outline, procedure of the Team, district and farmers, and remarks on the component.

Draft explanation paper on 16 approaches related to soil and water conservation was prepared and distributed to the extension officers concerned in the middle of October. Also, the textbook on water harvesting was delivered to the districts as a manual for the design and construction of water harvesting schemes for plant production.

The Farmers' Training programme for Kisarawe, Mkuranga and Rufiji district farmers in Morogoro in July 2002 included the item of soil and water conservation. In the field visit and classroom study, all 150 participants studied soil and water conservation measures, including contour farming and the "Ngolo" farming system, which is a traditional sloping cultivation method in Mbinga district.

Activity 3-2: Farmers prepare water bunds to plant seedlings

In November 2002, the demonstration on soil and water conservation was started at three sites of Vigama, Mwanambaya and Mkuranga. After the explanation and discussion with the farmers, an appropriate design of a water harvesting was employed for the 0.5-acre demonstration farms. The members of the group nurseries discussed and agreed to select the site, prepared a working schedule, and maintenance plan for themselves. The field preparation was made by farmers under the technical assistance of district offices and JICA support of 20 coconut seedlings. Some seedlings planted in the demonstration farms dried up due to extreme dry weather in 2003, but they were replaced by farmers themselves.

In the private farms, the farmers also applied conservation methods such as a water harvesting and contour farming even in a small scale on there own.

Activity 3-3: Farmers practice mulching for seedling planting

This activity was carried out simultaneously with Activity 3-2. When farmers planted the coconut seedlings in the farms, they employed mulching method for each plant. The individual farmers also used the mulching method in their own farms.

(4) Activity 4: Experiments of vegetables in Kibaha

Activity 4-1: Establish branch experimental plots in Viziwaziwa and Mwanabwito

The vegetable cropping tests were carried out at the experimental plots in Viziwaziwa and Mwanabwito four times, i.e., November 2001, July and November 2002 and July 2003. The total number of plots was 48. The selection of the plot sites and operators was made under the initiative of the extension officers concerned. The size of the plots was eight 5-m long ridges per site. The Team provided necessary materials, including seeds, fertiliser, agro-chemicals, watering cans and sprayers. The plot operators had the duty of record taking on daily works and harvest.

Activity 4-2: Conduct experiments on adaptability of new varieties/types of vegetables

The crop adaptability tests as well as the following input tests were carried out on the said experimental plots and also at Zegereni farm. The first cropping test at Zegereni farm started in February 2002, by using two varieties of tomatoes, okra and eggplant with four levels of fertiliser and three kinds of insecticide. The farm continued a lot of tests including the same tests as the experimental plots.

In the experimental plots mentioned above, crop adaptability tests and fertiliser tests were carried out four times. They included continuous fertiliser tests of tomatoes and other crop adaptability tests. The cropping test from June 2002 was successful in the production of onion and carrot, and the test from July 2003 tried producing of garlic and watermelon.

Activity 4-3: Carry out fertiliser, insecticide and fungicide tests in the seedling farm and branch experimental plots

This activity was carried out simultaneously with Activity 4-2.

Activity 4-4: Demonstrate new varieties/types of vegetables and the improved technique of vegetable cultivation

The Zegereni farm was used for training and demonstration on horticulture from June 2002. After the Leaders' Training in June 2002, seven CPMU chairpersons made a short visit at Zegereni farm. Also, on the last day of the Extension Officers' Training in July 2002, about 25 extension officers and district officers visited Zegereni farm. It was very effective that the participants learned actual crop husbandry method in the farm after the classroom study.

Many farmers in the project sites visited Zegereni farm and other sites to see the situation and had discussions with one another. Most of the participants got idea or production materials there. Some participants already challenged new crop cultivation or new crop husbandry methods.

4.6.4 Achievement of Objective of Project and Outputs

(1) Project Purpose: District offices develop human resources for the sustainable implementation of District Seedling Farm Programme

- The implementing system of Zegereni farm in Kibaha district was properly established in terms of facility and staff arrangement. The suitable financial arrangement, however, should be improved aiming at future autonomous operation because the financial support from local governments is very hard to get for the farm.
- The supporting system to the group nurseries were prepared in Kisarawe and Mkuranga districts from a viewpoint of technical level and human resources.
- The vegetable experimental plots, which are small scale with small operation cost, seem to be operated continuously by Kibaha district, in cooperation with Zegereni farm.

(2) Output 1: System to produce and distribute improved seedlings of fruit trees is formed well in Kibaha district

- Zegereni farm has been operated by Kibaha district since the beginning of 2002, as a fruit seedlings distribution centre as well as a horticultural training/demonstration centre. Zegereni farm distributed only 860 fruit seedlings to local farmers as of the end of October 2003, which was still far from the target of 10,000. The reasons are low production of mango seedlings due to improper management of soil, and low farmers' motivation to plant trees due to irregular rainfall.
- The production and distribution of seedlings of mangoes and citrus is expected to increase significantly because the technical difficulties have been solved.
- The distribution system of fruit seedlings, where the extension officers gave information to local farmers and collected their orders, performed well, as planned.

(3) Output 2: Systems to guide farmers' groups in seedlings production are formed well in Kisarawe and Mkuranga districts

- The group nurseries in Vigama, Mwanambaya and Mkuranga have performed very well in the production of improved fruit seedlings. The prepared seedlings were planted in the members' land first as mother trees, and the surplus was sold to obtain the next operation cost. Almost all members of the group nurseries planted the improved mango or citrus seedlings in their plots, and also other villagers have used them. In the questionnaire survey on the final evaluation, 66% of the farmers in the sites have already used the improved seedlings and 32% like to use them.
- The supporting system of district offices has been established well. Especially in Mkuranga

district, the district officers and extension officers made energetic support in provision of proper guidance technical and managing matters to the groups. Their persistent supporting works brought out new group establishment in the district.

(4) Output 3: Extension systems in soil and water conservation techniques are formed in Kisarawe and Mkuranga district

- The demonstration farms on soil and water conservation (micro catchment for water harvesting) were established in the three sites concerned. Many farmers learned the importance of the conservation methods, and most of them have already started or planned to make water bund and use mulching method in their orchard. In the final evaluation study, 78% of surveyed farmers reached such level.
- The supporting system of district offices has been established well. Especially in Kisarawe district, the extension officers committed themselves to the operation of the demonstration farm and the delivery of the technical support to the farmers.

(5) Output 4: Implementation system for vegetable cultivation tests is formed in Kibaha district

- The vegetable cropping tests have been carried out both at Zegereni farm and the experimental plots with good coordination among them. These tests used six kinds of vegetables; i.e., tomatoes, okra, onion, carrot, garlic, and watermelon, which were coordinated with the Plan of Operations. The implementing system of the experiments was prepared, although the data quality was not very reliable due mainly to irregular weather.
- The supporting system of Kibaha district offices has been established well. The staff of Zegereni farm and extension officers made technical assistance to farmers at the experimental plots in good coordination. The supporting system is expected to sustain and to be improved.

4.6.5 Evaluation

The final evaluation paying attention to the five evaluation criteria, i.e., efficiency, effectiveness, impact, relevance and sustainability, was carried out in October 2003, and the evaluation workshop was held on the basis of the Report for Final Evaluation Workshop attached in Annex. The main parts of the report are given hereinafter by each criterion.

(1) Efficiency

Almost all inputs were reasonable and were efficiently used to achieve the expected outputs.

- Almost all mobilised inputs (human, facilities and materials) were fully utilised and performed well for the implementation of the micro project. Especially, the Zegereni farm facilities, a pick-up truck and motorcycles, and the farm inputs were fully used to achieve the expected outputs.
- The excellent outputs of the vegetable cropping test and the group nursery were achieved

through small inputs. The soil and water conservation component was also going well. Meanwhile, the seedling production at Zegereni farm was not enough to cover the running cost of the farm, because of unexpected technical matter and harsh weather. The farm needs more time to improve its financial balance.

(2) Effectiveness

The expected four outputs were mostly achieved, and each district moved to prepare the operation system on the programme.

- All district agriculture offices recognised the project outputs, and supported the district seedling farm programme.
- Zegereni farm in Kibaha district has been operated in proper technical and organisational arrangement. However, it needs more time to make up the deficit of Zegereni farm due to certain reasons.

(3) Impact

The programme has given positive impacts on the horticultural development to the target farmers and also to other farmers.

- The improvement of vegetable production is making farmers' income larger.
- The farmers in and around the target groups have started to produce grafted or budded fruit seedlings successfully. The number of the new voluntary groups was nine in Mwanambaya, five in Mkuranga and one in Kisarawe at the final evaluation time.
- The farmers in and around the target groups have started to use soil and water conservation techniques in their orchard.
- The farmers have started to produce new kinds of vegetables as well as off-season vegetables to enlarge their income. Especially, the cultivation of onion, carrot and garlic has expanded in Viziwaziwa and Mwanabwito. Also the farmers in Mwanabwito have started to diversify cropping season, instead of the single season starting at June.

(4) Relevance

The objective of the programme is relevant, judging from the relating government policies and farmers' needs.

- The programme is in harmony with the national development policy.
- The scheme of Zegereni farm was involved in the District Agriculture Development Plan (DADP) of Kibaha district in 2003. The farm is recognised as not only seedling production centre, but also integrated horticultural training/demonstration centre in Kibaha district or Coast region.
- The farmers participated in the group nursery and experimental plot positively and intended to continue their works.
- Many voluntary groups were established in and around the JICA-supported groups to produce fruit seedlings.

(5) Sustainability

The programme is judged to be sustainable, because the operating systems have been established properly and the implementing costs are not very high except the district-operated farm.

- Almost all district and extension officers concerned with the programme continue their duties.
- The minimum operation cost of Zegereni farm might incur from its bank account, sales of farm products, annual budget of local government and DADP.
- The target group nurseries will continue, and their activity is expanding to other villagers in Kisarawe, Mwanambaya and Mkuranga.
- Soil and water conservation method will expand in the villages, and the farmers themselves will maintain the demonstration farms.
- The experimental/demonstration plots will continue at least in Kibaha district.

4.6.6 Analysis and Lessons Learned

(1) Operation of Zegereni Farm

The accounting balance of Zegereni farm has not been improved yet. The scenarios that may realise a self-supporting accounting system are proposed. It is strongly recommended that the work should be concentrated to produce high value-added crops including fruit seedlings in the next two years. After the improvement of the financial performance, the farm shall fully perform the original function including vegetable cropping tests and horticultural demonstration/training.

The accounting balance of Zegereni farm has not been improved yet. The monthly expenditure and income is shown in the following chart. The expenditure has decreased since December 2002 and records a monthly value of about TShs 614,000 in average from January to October 2003 with a large portion taken by is wage of workers and watchmen. The monthly income is about TShs 104,000 in average during the same term. The main income source still comes from the sales of vegetables rather than fruit seedlings. In this year, the vegetable production did not go well due to the unfavourable high temperature recorded during the cool season. The total sale of fruit seedlings is about TShs 500,000 out of the overall accumulated income of TShs 2,110,000.

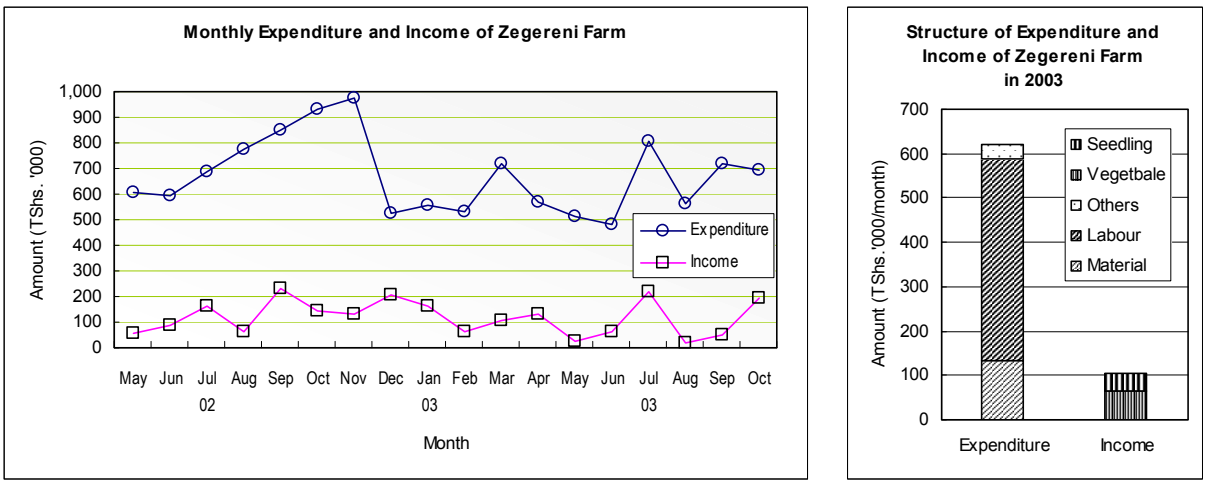

Fig. 4.6.3 Monthly Income and Expenditure of Zegereni Farm

The Zegereni farm has made effort to improve its financial situation and to achieve a self-supporting accounting system. To increase income, for example, it tried to produce watermelon in the orchard area, to produce high-value crops such as sweet corn, garlic and zucchini, to make various seedlings such as avocado, custard apple and breadnuts. On the other hand, it also cut down expenditure also cut down by reducing the number of workers from 15 to 10 on December 2002. The operation cost should be reduced more to meet limited profitable works only, such as mango/citrus seedling production, for a while.

The bank account of Zegereni farm keeps about TShs 2 million as of October 2003. It is the sales income from vegetables and fruit seedlings during the Verification Study. From November 2003, the farm will use this as an operation cost, unless there is any financial support from outside. A prospect of the financial balance of the farm can be made up to the end of 2005 under the following three scenarios.

Scenario 1: High cost (TShs 500,000/month), Seedling and vegetable production

8 workers, 3 watchmen, material cost at TShs 80,000/month

Sales of vegetables at TShs 50,000/month

Sales of 2,000 coconut, 1,000 mango and 1,000 citrus seedlings in 2004

Sales of 3,000 coconut, 2,000 mango and 2,000 citrus seedlings in 2005

Scenario 2: Middle cost (TShs 400,000/month), Seedling and selected vegetable production

5 workers, 3 watchmen, material cost at TShs 85,000/month

Sales of vegetables at TShs 20,000/month

Sales of 2,000 coconut, 800 mango and 800 citrus seedlings in 2004

Sales of 3,000 coconut, 1,500 mango and 1,500 citrus seedlings in 2005

Scenario 3: Low cost (TShs 300,000/month), Seedling and limited vegetable production

3 workers, 3 watchmen, material cost at TShs 55,000/month

Sales of vegetables at TShs 10,000/month
Sales of 1,800 coconut, 600 mango and 600 citrus seedlings in 2004
Sales of 3,000 coconut, 1,200 mango and 1,200 citrus seedlings in 2005

As shown in the following chart, the bank balance will go downward in 2004 and the beginning of 2005, and go upward in late 2005 to the initial amount of TShs. 2 million in every scenario. In scenario 1 and 2, however, the farm operation would stop in the 2004 dry season because the balance will be negative. Only in scenario 3, the bank balance will remain positive throughout the time. Although the agricultural prospect has a lot of uncertain factors, the analysis strongly recommends that the operation cost be reduced to a TShs. 300,000 level and the work be concentrated to produce high value-added crops including fruit seedlings in the next two years. After the improvement of the financial performance, the farm shall fully perform the original function including vegetable cropping tests and horticultural demonstration/training.

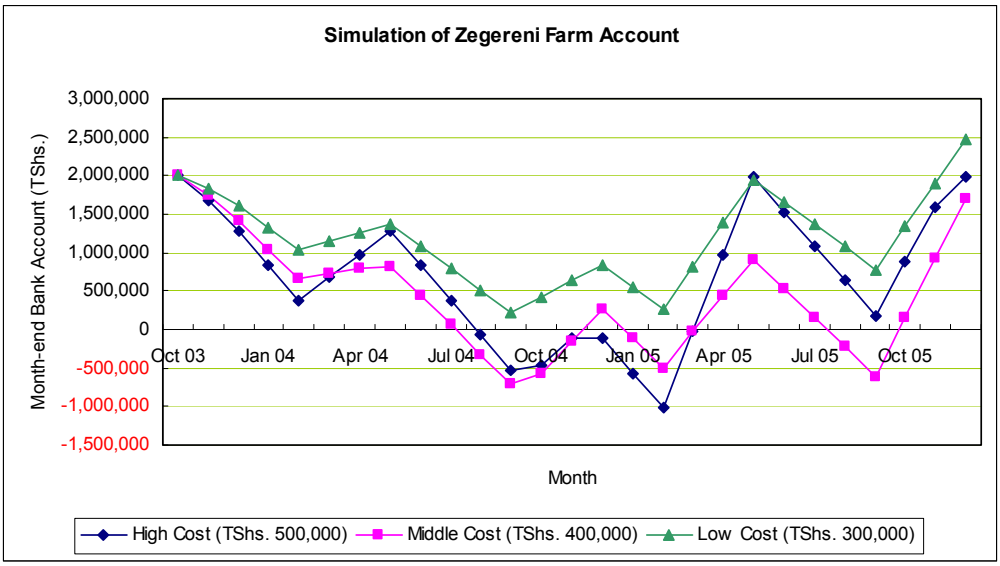

Fig. 4.6.4 Forecast of Accounting Balance of Zegereni Farm

(2) Performance of Group Nursery

The group nurseries were operated very well especially in Mwanambaya and Mkuranga. Other villagers have formed voluntary groups for the seedling production in and around the project sites, without direct support of the Team, while Vigama groups are not fully developed yet. The different development types occurred for several reasons, as below.

- The people in Vigama have not enough business mind, compared with other relatively urbanised villages.
- The people in Mwanambaya and Mkuranga could concentrate more on the group nursery activities.
- The condition of water sources is slightly better in Mwanambaya and Mkuranga than in

Vigama.

- The extension services to the people in Mwanambaya and Mkuranga were more frequent than Vigama because of the availability of motorcycles.

In the implementation of the programme, efficient sites should be selected, referring to the study results.

Table 4.6.1 Comparison of Sites of Group Nurseries

	Vigama	Mwanambaya	Mkuranga
Location, Topography	Small sub-village along light-traffic road after Kisarawe town. Hilly area with medium soil.	Town along main road between DSM and Mkuranga. Hilly area with medium soil.	Capital town of Mkuranga district. Hilly area with fine soil.
Water source	Kisima in valley is water source for crop husbandry. All kisima dried up in this long dry period and only 2-km away small stream was available.	Kisima in valley is water source for crop husbandry. Some kisima dried up in this long dry period but some did not.	Kisima in valley is water source for crop husbandry. Some kisima dried up in this long dry period but some did not.
Micro-project	Several micro-projects were carried out in the small community, including multi-purpose shed, mill and group nursery.	A micro-projects of group nursery was solely carried out.	A micro-projects of group nursery was solely carried out.
Farmers training	Group members took part in Farmers Training in Morogoro. Villagers in Kisarawe town participated.	Group members and non-member villagers took part in Farmers Training in Morogoro.	Group members and non-member villagers took part in Farmers Training in Morogoro.
Extension service	WAEO and VAEO provide extension services, but they were not very close due to lack of transportation.	DSMS and WAEO provided close extension services with motorcycles. A new VAEO was placed in 2002.	DSMS and WAEO provided close extension services with motorcycles. The VAEO is temporarily vacant.

(3) Performance of Soil and Water Conservation

The sub component of soil and water conservation required time to motivate farmers. The Team took a long process, such as; 1) to make on paper the technical guidance to extension officers and key farmers, 2) to take them to developed sites within the "Farmers Training" component, 3) to prepare demonstration farm in the sites, and 4) to make them discuss among themselves in the final evaluation workshop. The farmers have recognised the importance of the conservation techniques especially in the training course in Morogoro, which included field visit of contour farming and Ngolo farm, discussion with farmers and SUA staffs and classroom teaching on the conservation farming.

In the implementation of the minor programme, the sites efficient process should be taken, referring to the study results.

(4) Performance of Experimental Plots

The experimental/demonstration plots were operated well in both Viziwaziwa and Mwanabwito. Different impacts were made on the villagers, because the agro-ecosystem and cropping style are quite

different between the two villages and also the business mind in Viziwaziwa was stronger than Mwanabwito.

The Viziwaziwa villagers got great impact only from onion and carrot cropping test, which were newly produced in the village and yielded high prices. The Mwanabwito villagers got more impacts through the plot operation, including ridge making, fertiliser application, chemical use, watering and introduction of new vegetables.

District and extension officers in the villages made the guidance, instruction and follow-up. It was a point of good performance even by some inexperienced villagers.

In the implementation of the programme, the sites efficient to the purpose should be selected, referring to the study results.

Table 4.6.2 Comparison of Sites of Experimental Plots

	Viziwaziwa	Mwanabwito
Location, Topography	Village at 5 km away from Morogoro road. Undulating area with coarse soil.	Remote village 12 km away from Morogoro road. Alluvial plain along the Ruvu river, with fine soil.
Water source	Kisima in valley is water source for crop husbandry. Some kisima dried up in this long dry period but some did not.	The Ruvu river and ponds are water source for crop husbandry. Some ponds dried up in this long dry period.
Faming system (before project)	High-input vegetable production. Vegetable growers use fertiliser and agro-chemicals. Watering must be practiced. Several kinds of vegetables are planted.	Low-input vegetable production. Vegetable growers do not use any fertiliser and agro-chemicals. Most of them do not practice watering. All vegetables are tomato and okra only.

(5) Intervention through Local Government Staffs

Almost all interventions to the farmers have been made through the district and extension officers concerned, and then this brought good results. The capability and efforts of the officers could guide the farmers to successful results. On the other hand, the Team only gave information to the officers and made implementation plans though discussions with them. The Team did not directly control the farmers, but indirectly motivated them. Such standpoint of donor could be one of the reasons for success of group nurseries and experimental plots.

In case that donor or NGO supports the implementation of the programme, such manner should be referred in the process.

(6) Action at Field

The actions should be taken in front of target farmers of the group nursery and the experimental plot to make excellent impacts. The members of group nurseries learned and practiced production methods of fruit seedlings including grafting and budding on site and step-by-step. Soon after that they could do

same things at their sites easily and produce a number of improved seedlings. On the other hand, the experimental plots disclosed the possibility of new vegetable production, such as onion and carrot, and effect of fertiliser application even in the Ruvu River plain, by farmers themselves.

In addition, when a part of the villagers gets good results from a new trial, the rest would start to do the same things very quickly. In fact, the new group nurseries have been established and many farmers have challenged to grow new vegetables.

In case that donor or NGO supports the implementation of the programme, such manner should be referred in the process.

(7) Combination of Micro Projects

The close relationship of components is one point of success. There exist multiple effects of several components. It must be noted that all good performances of the programme have been strongly supported by Capacity Building Programmes. At the same time, the Zegereni farm has supported Capacity Building Programmes. There were also favourable interactions between experimental plot operators and other group members of input credit or pump.

The sound quantity of components is another point of success. The rural development programme usually consists of several sub-programmes in one area. If many components run simultaneously in small community like Vigama, the villagers may loose their right target or objective. On the contrarily, simple project implementation like Mwanambaya and Mkuranga can easily achieve the target.

In the preparation of the implementation plan, the proper combination of the components should be considered for better results.

(8) Implementation Process of District Seedling Farm Programme

To implement the District Seedling Farm Programme, the district-operating farm is not always essential in the early stage. A possible way is selective implementation of parts of the programme.

The District Seedling Farm Programme is a main physical component of Community Based Horticultural Development Programme in the M/P, and the district seedling farms like Zegereni farm in Kibaha district were planned to be established in every five districts. However, the programme composed of not only the district-operated farms, but also vegetable experimental/demonstration plots and group nurseries in several villages.

As a result of the verification study, the following facts were attained.

- The experimental/demonstration plots in Viziwaziwa and Mwanabwito have performed well, especially for the purpose of new crop dissemination among villagers. The district and extension

officers have been able to provide good assistance to the farmers groups without district-operated farm.

- The group nurseries in Vigama, Mwanambaya and Mkuranga have performed very well. They have produced a number of improved fruit seedlings with grafting or budding by group members under proper support by district and extension officers. The groups surely sustained to provide improved seedlings by taking materials in their own mother trees. Furthermore, many voluntary groups were established around them for the same purpose.
- Zegereni farm has played a very important role in the verification study, especially in the fields of vegetable cropping tests as well as training/demonstration of horticulture. The district staffs of Kibaha have operated the farm very well, and all officers concerned recognised the farm as the only integrated horticulture centre in the region. Only its financial performance has still not improved yet, because of several reasons, such as irregular rainfall, soil handling method, etc.

To implement the District Seedling Farm Programme, the district-operating farm is not always essential in the early stage. A possible way is selective implementation of parts of the programme. For example, Mkuranga district can spread out group nurseries for enhancement of its fruit production, and the farm of Ruvu Darajani pump groups can be used as an experimental plot for Bagamoyo district. Such low-cost components can accomplish fruitful results in horticulture development. The district-operated farm can be future option within the programme because of limited budget.

4.7 Process and Evaluation: Model Sites

4.7.1 General

Each micro project is small and cannot affect a whole village. However, the implementation of several micro projects simultaneously in one village brings about effect of integrated rural development.

The Verification Study has the intention to examine whether the horticultural project gives any impact on the project villages and if the projects are sustainable. From that point of view, to evaluate villages where several micro projects have been implemented is inevitable. Selected villages with several micro projects carried out are Viziwaziwa in vegetable promotion area and Vigama in fruit promotion area.

Overall evaluation of the projects in one village focuses on the following four points. The first two points are related to monitoring system of the projects to secure smooth implementation.

- Leaders' ability for dealing with several projects,
- Extension and District Officers' capacity for supporting farmers,
- Effect of several projects implemented simultaneously, and
- Possibility of expanding projects and lessons learned by villagers.

4.7.2 Viziwaziwa

The micro projects, namely, Input Credit, Improvement of Watering, Capacity Building for Extension Officers, Capacity Building for Community (Farmers' Training, Group Leaders' Training, Multi-purpose Shed and Milling Machine) and Branch Experimental Plot, have been carried out at Viziwaziwa. The following is the summary of Project Design Matrix of Viziwaziwa

Overall Goal	* Action plans are implemented. * Farmers' income is increased.
Project Purpose	* System of administration and community to increase farmers' income in the vegetable development area is set up.
Output	Sufficient outputs are obtained from every V/S component. - Input Credit - Improvement of Watering Facilities - Capacity Building for Extension Officers - Capacity Building for Community - Experimentation plot of District Seedling Farm
Activities	1 To form Community Project Management Unit 2 To implement activities plan of V/S components - Input Credit - Improvement of Watering Facilities - Capacity Building for Extension Officers - Capacity Building for Community - Experimentation plot of District Seedling Farm 3 To implement activities plan of V/S components - Input Credit - Improvement of Watering Facilities - Capacity Building for Extension Officers - Capacity Building for Community - Experimentation plot of District Seedling Farm
Input	[JICA] Personnel JICA Team Facilities Necessary facilities for V/S components (buildings, experimental equipment, etc.) Materials and equipments Necessary materials and equipments for V/S components Cost for management Necessary materials and equipments for V/S components (cost for training and fuel) [Tanzania] Personnel Agricultural Dep. In District office, Extension officers, Facilities Necessary facilities （mainly land） Materials and equipments Necessary materials and equipments for V/S components (agricultural tool, etc.) Cost for management Necessary materials and equipments for V/S components (labour, etc.)

(1) Achievement of Project Purpose and Outputs

1) Project Purpose

- The farmers concerned have shown some success in some micro projects, but not in all. Successful micro projects are Farmers' Training, Group Leaders' Training, Extension Officers' Training, Multi-purpose Shed and Branch Experimental Plot. Partially successful one is Input

Credit. On the other hand, there were some problems in Input Credit (low repayment rate) and Milling Machine (few customers).

- CPMU has obtained knowledge and been active in communication with outside. Therefore, the system has been set up.

2) Outputs

- Members obtained cooperative mind
  The villagers themselves planned, constructed and managed the facilities of the micro-projects. These activities have created cooperative mind and ownership to the members.
- Structural poverty was reduced to some extent
  The contact between the village and the District and/or the Region has become very tight through the Study. Not only the extension officers but also many other district officers frequently visited and discussed with the villagers. DPMC meetings were periodically held. The communication between the village and the government has become better and smoother.
- There is multiplier effect derived from various projects
  Good effect was influenced by good interaction among various project components. These include Input Credit where the farmers aim at increase of produce, Farmers' Training where the farmers have acquired a good grasp on agriculture, Extension Officers' Training where the extension officers have gained the agricultural knowledge and how to communicate with the farmers; and Community Facilities where the members create cooperative mind through construction of the facilities.

(2) Process of Implementation

- See the detail in the result of each micro project.

(3) Evaluation

1) Efficiency

As a result of the activities carried out with a proper use of input, the expected outputs have been achieved mostly.

- Input for the verification projects were carried out according to the plan.
- The planned efficiency concerning Input Credit and Milling Machine was not properly achieved due to its low repayment rate and frequent trouble of the machine.
- CPMU members can be more aware of their responsibility, since many micro projects are active under their supervision, which shows their strong leadership on the project.

2) Effectiveness

It is possible to say that CPMU here is achieving Project Purpose, "System of administration and community to increase farmers' income in the vegetable development area is set up". CPMU has a possibility to be an implementing body of rural development action plan.

- According to the inquiry study, some farmers increased their income.

- Poor tie between the village and the district officers has been replaced with strong tie between them due to DPMC and other activities related to the project.
- Since the extension officer in charge of many projects in Viziwaziwa, his visit to the village has increased. The more he visited, the more the villagers came to rely on him.
- CPMU's supervision could not cover all the micro projects properly because of limitation of their ability especially in a physical standpoint.
- All the micro projects needed the extension officer's supervision to some extent, which was difficult by a single person.

3) Impact

There is some progress in horticultural technology that brings farmers increase of income. Villagers have obtained 'my good village mind (love of one's hometown)' through the Verification Study, which brought them invigoration of the village.

- The village has become famous as a vegetable production area and the number of middlemen who visit the village has increased accordingly.
- Some farmers produced new vegetables like, onion, carrot, paprika, and so forth, which were not seen before around the village. Thanks to the Zegereni farm that has been transferring its acquired knowledge and technique.
- As Multi-purpose shed and Milling Machine have become centre facilities of the village, some farmers moved near the shed.
- Frequent machine breakdowns have demoralised group members who are discouraged and do not follow constitution established by CPMU anymore.

4) Relevance

The project purpose that mostly covers villagers' needs coincides with agricultural development policy of Tanzania.

- The district agricultural officers have an intention to implement the micro projects, and they will plan DADP with the current projects.
- CPMU hopes to continue the micro projects.

5) Sustainability

Since the micro projects implemented satisfy the needs of the villagers, they will surely continue implementation of the projects. However, it is not sure if replication of them will be made to other villages.

- It is not the time to say if the system of administration and community to increase farmers' income in the vegetable development area has been maintained and extended. However, the knowledge and technology of vegetable cultivation obtained in the V/S seems to be maintained and to bring the farmers the increase of income.
- It is confirmed that all the trained staff members of CPMU who have been getting practical knowledge will stay up.

- CPMU has shown its possibility to become a managing body of the Action Plan of rural development.
- Replicating the set of micro projects to other villages is difficult without assistance from outside.

(4) Lessons Learned

- The positive interaction among various project components can influence success
  Good effect was influenced by good interaction of various project components. Therefore, the combination of components shall be well considered in order to gain good interaction. Combination of training and them of interchange among farmers in different villages and officers is effective for the success of the projects.
- Water is indispensable for agricultural projects
  Viziwaziwa is located on a rather hilly area without rivers around, and water sources are limited to small ponds and Kisima. Therefore, once drought occures, it is very difficult to continue vegetable cultivation. Therefore, Some farmers have failed to pay back their loan of Input Credit due to prolonged and successive droughts. Moreover, the severe drought in 2003 that reduced cereal produce accelerated the decrease of customers of Milling Machine.
  For the selection of agricultural project sites, it is important to examine water conditions strictly. As for the agricultural development, irrigation water is indispensable especially in the area of unstable weather.
- Take care of extension officers not to give over load
  CPMU Viziwaziwa has implemented many micro projects, while only one VAEO is allocated. Therefore, it became a hard work for VAEO to assist the members in addition to his routine duties. The same thing can be said to CPMU chairperson who also devotes himself to the projects implementation in addition to his daily farming activities. It is important to secure number of extension officers suitable for the project implementation.

4.7.3 Vigama

The micro projects, such as Capacity Building for Extension Officers, Capacity Building for Community (Farmers' Training, Group Leaders' Training, Multipurpose Shed and Milling Machine) and Group Nursery, have been carried out at Vigama.

Effect of the combination of each project is not so large in Vigama as in Viziwaziwa. The reasons may be that the group formation project was so heavy for Vigama people that they did not have much energy for other projects. The previous leaders were not so active; Frequent troubles of husking machine gave the villagers lose the chance to earn money with the milling machine. The following is the summary of Project Design Matrix of Vigama.

Overall Goal	* Action plans are implemented. * Farmers' income is increased.
Project Purpose	* System of administration and community to increase farmers' income in the fruit development area is set up.
Output	Sufficient outputs are obtained from every V/S component. - Capacity Building for Extension Officers - Capacity Building for Community - Group Nursery
Activities	1 To form Community Project Management Unit 2 To implement activities plan of V/S components - Capacity Building for Extension Officers - Capacity Building for Community - Group Nursery 3 To implement activities plan of V/S components - Capacity Building for Extension Officers - Capacity Building for Community - Group Nursery
Input	[JICA] Personnel JICA Team Facilities Necessary facilities for V/S components (buildings, experimental equipment, etc.) Materials and equipments Necessary materials and equipments for V/S components Cost for management Necessary materials and equipments for V/S components (cost for training and fuel) [Tanzania] Personnel Agricultural Dep. In District office, Extension officers, Facilities Necessary facilities （mainly land） Materials and equipments Necessary materials and equipments for V/S components (agricultural tool, etc.) Cost for management Necessary materials and equipments for V/S components (labour, etc.)

(1) Achievement of Project Purpose and Outputs

1) Project Purpose

- The farmers concerned have shown some success in some micro projects, but not in all. Successful micro projects are Farmers' Training, Group Leaders' Training, Extension Officers' Training and Multi-purpose Shed. Partially successful one is Milling Machine. On the other hand, there were some problems in Milling Machine (few customers), Group Nursery and Soil and Water Conservation (lack of water).
- CPMU is on the way to form firm organisation due to the recent change of leaders. Therefore, the system will be set up from now.

2) Outputs

- Members obtained cooperative mind

  The villagers themselves planned, constructed and managed the facilities of the micro-projects. These activities have created cooperative mind and ownership to the members.
- Structural poverty was reduced to some extent

The contact between the village and the District and/or the Region has become very tight through the Study. DPMC meetings were periodically held. The communication between the village and the government has become better and smoother.

- There is multiplier effect derived from various projects

  Good effect was influenced by good interaction among various project components. These include Farmers' Training where the farmers have acquired a good grasp on agriculture; Extension Officers' Training where the extension officers have gained the agricultural knowledge and how to communicate with the farmers; and Community Facilities where the members create cooperative mind through construction of the facilities.

(2) Process of Implementation

- See the detail in the result of each micro project.

(3) Evaluation

1) Efficiency

As a result of the activities carried out with a proper use of input, the expected outputs have been achieved to a certain extent.

- Input for the verification projects were carried out according to the plan.
- Group Nursery and Soil and Water Protection projects were delayed due to the shortage of water.
- Milling machine project did not show the planned effect due to the machine trouble and small amount of maize production.

2) Effectiveness

It is possible to say that CPMU here is achieving Project Purpose, "System of administration and community to increase farmers' income in the vegetable development area is set up". However, it is still uncertain that CPMU has a possibility to be an implementing body of rural development action plan.

- Even though some micro projects do not function as it should be, all the projects have contributed to the villagers' awareness creation on cooperation.
- Poor tie between village and district officers has been replaced with strong tie between them due to DPMC and other activities related to the project.
- The introduction of the milling machine at Vigama made milling service available at the village premises and saved time for the farmers especially women who became able to allocate longer time for their fieldwork and housework. However, the number of customers was far below than the planned one.
- Farmers involved in the nursery projects have acquired knowledge on nursery preparation and management for various horticultural crops. They know how to conduct grafting and budding practices. They have learned and practised principles of crop production such as land preparation, spacing, and crop pest management. They have learned and practised agriculture on

sloping landscapes using the technique of Soil and Water Conservation. They have started increasing their income through sales of grafted mango seedlings as well as budded citrus. They have planted seedlings in their own plots.

- CPMU does not seem to obtain enough management ability for overseeing all the micro projects. In addition, the first chairperson did lost his interest in the project and quitted.
- All the micro projects require the extension officer to supervise, however it is difficult to do so by one officer.
- Most of the micro-projects, especially Multipurpose Shed and Milling Machine, were planned, constructed and managed under the villagers leading. These activities have created cooperative mind and ownership to the members.

3) Impact

Villagers have obtained 'my good village mind' through the Verification Study, which brought them an invigoration of the village.

- After taking part in the farmers' training in Morogoro, 25 farmers set up a new group for horticultural development at Kisarawe. They are not within the micro projects implemented in Vigama, but are very active, trying to set up a group nursery and "A type" contour cultivation.

4) Relevance

The project purpose that mostly covers villagers' needs coincides with agricultural development policy of Tanzania.

- The district agricultural officers have an intention to implement the micro projects, and they will plan DADP with the current projects.
- CPMU hopes to continue the micro projects.

5) Sustainability

Since the micro projects implemented satisfies needs of the villagers, they will surely continue implementation of the projects. Replicating a part of micro projects in Vigama may be possible for other villages, as there exists a sample of new group formation.

- Staff members of CPMU changed to new members, but most of the trained members will stay up.
- Replicating the set of micro projects is difficult for other villages without assistance from outside.

(4) Lessons Learned

- The positive interaction among various project components can influence success

  Good effect was influenced by good interaction of various project components. Therefore, the combination of components shall be well considered in order to gain good interaction. Combination of projects of training and them of interchange among farmers in different villages and officers is effective to succeed the projects.

- Water is indispensable for agricultural projects
  The most serious problem at Vigama is water sources. Most of the Kisimas have dried up due to prolonged draught. It hampered nursery production.
  For the selection of agricultural project sites, it is important to examine water conditions strictly. As for the agricultural development, irrigation water is indispensable especially in the area of unstable weather.
- Take care of extension officers not to give over load
  CPMU Vigama has implemented many micro projects, while only one VAEO is allocated. Therefore, it became a hard work for VAEO to assist the members in addition to his routine duties. It is important to secure number of extension officers suitable for the project implementation.

4.8 Summary of the Verification Study

4.8.1 General

1) Reduction of Structural Poverty

Farmers attended every administrative meeting like DPMC meeting, Joint DPMC meeting and Steering Committee meeting and presented their opinions actively. DPMC meeting is a bimonthly meeting with district officers and farmers to discuss project matters and to interchange their opinions. The details of these meetings have been recorded in minutes of meeting. Through these meetings, the farmers have created ownership and the channel between the administration and villagers has become thick.

2) Positive Interaction among Micro Projects

Evaluation of each project is important, and the evaluation of positive interaction among the projects is also important. For instance, trainings for farmers and extension officers brought about good stimulation and knowledge to trainees, which affected positively to all the related projects. The experience of construction of a multipurpose shed and a mill house by themselves has empowered the villagers. This experience made a repayment rate of credit higher. It proves that participants of the construction have created awareness of considering the projects as a common issue to the farmers. The new kinds of vegetables that had been developed in Zegereni farm were extended through vegetable experimental plots with the technical assistance of extension officers. Input Credit project gave knowledge to the farmers how to use fertiliser and chemicals with the awareness of necessity of repayment. As a result, these activities affected organically one another and made high multiplier effect.

On the other hand, the quantity of the projects shall not be increased thoughtlessly to acquire such positive interaction. There will be a possibility to meet negative effect on achieving the projects derived from the over load for the extension officers and CPMU leaders, if one village holds many

projects. In the preparation of the implementation plan, the proper combination of the components should be considered for better results taking the capacity of the villagers' labour force, the extension officers and CPMU cadres into account. Concerning the projects that require much labour force, their number and scale shall be adjusted to the villagers' capacity.

3) Gap of villages in Economic Level

There are big differences concerning acceptance of project and its good use, between a village along the highway that is exposed to the marketability and other far from the highway. The former may be active in the project in every aspect and the latter may not. The latter always waits for a good donor to bring everything. This affects success or failure of the project. The latter has high possibility of project failure. For the villages whose living standards and economic level were low, technical assistance should have been provided.

4.8.2 Input Credit

Even though Input Credit is only one part of the sub-programmes in the "Community Based Horticultural Development Programme", it occupied a big portion in the Verification Study, because much energy was put into this project to look for the countermeasures of the low repayment rate of only 52%. The Team obtained many experiences and information through its implementation. The details are described in "4.2 Input Credit". The outcome of the study can be a good reference in the same kind of project.

In order to make an Input Credit project for vegetable cultivation successful in the similar area to the verification site, the following activities may be essential; the government organisation shall not be an implementation agency; the agency must severely check the loanees; maximum loan amount shall be within the loanees' capability; and a loanee shall have stable water source.

Although repayment rate is low, a half of the loanees have already repaid. Considering this situation, Input Credit has a strong possibility provided that the following conditions are adopted: CPMU shall be an implementation agency; only fully repaid farmers can get another loan; and a loanee must have stable water source. The project should continue even in a small scale, as it has possibility to expand in the future.

4.8.3 Improvement of Watering

There are big differences in the result of engine pump project depending on the sites. One reason of the differences comes from the distance to the main road. The site near to the road is normally near to the market. Farmers near to the market generally have an economic and competitive mind, which cultivates a managing capacity. They promote a group formation in order to compete with other producers. They would challenge without waiting for any assistance. The Team implemented the projects in Ruvu Darajani and in Mwanabwito and found such differences in two villages. The Team

also obtained much information, which would be useful for the future project.

Treadle pumps were not used, since its operation needs two persons and the operation sometimes damages the crops. However, treadle pumps shall be recommended for limited water sources with small amount of water. When the treadle pumps are introduced, they shall be applied for such case as watering crops at farm far away from the water sources. In this case, a reservoir shall be made between the source and the farm, and the water shall be conveyed to the reservoir by the treadle pump. Subsequently, the crops are watered using polyethylene tanks.

As for watering, the CPMU chairperson of Viziwaziwa practises twice every 3 days watering. The sample of watering is too small to get the conclusion, but if this watering frequency is reasonable, farmers can save labour very much.

4.8.4 Capacity Building for District and Extension Officers, Farmers' Training and Group Leaders' Training

The Team focused on the extension officers who stand in the position between administration and farmers in the Verification Study. Therefore, they took part in any kinds of trainings, not only extension officers' trainings but also farmers' and group leaders' trainings. They participated in the training courses once as trainees of horticultural or participatory techniques and at another time as teachers or facilitators. Furthermore, the Team gave the chance to officers of the Region and Districts, extension officers and farmers to gather together to discuss and to interchange opinions. This activity would have empowered them. All the Districts are aware of the importance of the extension officers' training and show the will to continue the training by themselves even after the Study finishes.

There was an extension officer in charge of a certain village whom the villagers did not know before the Study, however, the frequent visit of extension officers to the villages made him very much acquainted to the villagers during the Study. Furthermore, extension officers have raised their knowledge through many training courses. Therefore, farmers' reliance to the extension officers has increased. Accordingly, the extension officers have higher pride than before.

4.8.5 Capacity Building for Community

Interchange of opinions among group leaders was practised in the group leaders' training. The leaders were empowered through this activity.

Farmers visited advanced villages, studied new technology and interchanged opinions. They got a good stimulation that brought about revitalisation of their activities.

The Team also gave villagers chances of interchange among themselves as much as possible. Especially the interchange of inactive villages and active ones gave a big stimulation for both. The

Team used Zegereni farm many times as a training site.

From the viewpoint of grouping, groups performing good management such as a pump group of Ruvu Darajani, nursery groups of Mwanambaya and Mkuranga and a mill group of Mwanabwito are successful in group formation. These groups can be energetic and tough when they start new projects. Multipurpose sheds and milling machine were used as tools of Capacity Building for Community in the Study. Villagers took part in these micro projects from the planning stage and collected money to buy land for the facilities, which they constructed by themselves and autonomically managed. Large empowerment on group activities has been created among the villagers through these activities. The important point to be reminded is that farmers themselves carried out these activities. Concerning the repayment rate of Input Credit in Viziwaziwa, a group that participated in the multipurpose shed project presented a higher rate than that of no participation.

4.8.6 District Seedling Farm

1) Zegereni Farm

Zegereni farm challenged to cultivate new vegetables that had been difficult to cultivate in Coast Region and found it successful to cultivate them in the cool season. Those vegetables are onion, carrot and garlic.

The farm also challenged to cultivate vegetables that farmers in the Study area had rarely cultivated. Farmers had a big interest when the farm showed the produce of such vegetables. Those are sweet corn, watermelon, sweet pepper and eggplant of Arusha variety.

The farm challenged nursery production of mango, citrus and coconut. The result of mango production was not good due to soil problem. As the farm has found the cause of the problem, the survival rate of mango seedlings would increase.

Through these activities there arose new movement in the villages as shown below.

- Farmers became energetic to try new crops.
- Farmers had the possibility to get more income.
- Farmers became energetic to get more technical assistance from extension officers and Zegereni farm.
- Cultivation of new vegetables is spreading in the villages.

Zegereni Farm has been frequently used as a training centre. Forthcoming problem is the sustainability of the farm management.

2) Group Nursery

Group nursery projects are carried out in Mkuranga, Mwanambaya and Vigama. The management of

Mkuranga and Mwanambaya is well under way and they could support themselves without any assistance from donors, thanks to their ability, good groups' coordination and the technical assistance of extension officers.

3) Soil and Water Conservation

Farmers realised the importance of land protection through the practice in the soil and water conservation project even though coconut seedlings that were planted in the project died due to the drought. They had also learned Ngoro land protection system and contour cultivation method in the farmers' training. These activities were useful in the sensitisation on land protection.

4.8.7 Others

1) Identification of Capable Persons

Many talented persons and groups were identified through the Verification Study. They have promoted their projects and have given other groups some good stimulation.

- CPMU chairperson of Viziwaziwa: He took part in every project in the village. He played a leading role in implementing Input Credit. His farm where he has tested cultivation of some vegetables from Zegereni Farm is one of the most important demonstration plots. He distributed to many farmers seeds of paprika that he had obtained in Arusha to extend them. He was recognised twice in 2002 and 2003 as the best farmer in the national agricultural festival.
- CPMU secretary of Ruvu Darajani: He has coordinated 25 members of the pump group well from the planning stage until managing and repayment stage.
- Group nursery at Mwanambaya: Three groups led by mainly young men actively performed their activities, and they set up a self support system of group nursery in a short time.
- Mill group at Mwanabwito (mainly women): Since there was a big demand for milling, women's group performed actively deciding each member's role. They strengthened the group through everyday business.

2) Expansion of Projects

The Verification Study has been expected to promote expansion of the projects. The followings show some movements of expansion that happened during the Verification Study.

- Production of new vegetables that were not cultivated in the study area is expanding.
- A new horticultural group was formed in Kisarawe.
- Villagers in Mwanabwito constructed a multi-purpose shed by themselves using wood and soil stimulated by that of Ruvu Darajani. As there was no donor who could help them, they used wood and soil that were easy to get near the site. This action shows that if need requires, any villages would construct such facilities by themselves.
- A group outside of the project made a mill in Mwanabwito. Even though this action gives a minus impact to the management of the existing mill, it is in fact an expansion of the project.
- CPMU Ruvu Darajani began to manage input credit by itself.

- The nursery groups of Mkuranga and Mwanambaya began trial of vegetable cultivation.
- New groups outside of the project have started to be formed in Mkuranga and Mwanambaya to grow nursery.

Chapter 5 Master Programme

5.1 Community Based Horticultural Development Programme

5.1.1 Feedback of Verification Study Result

The Verification Study dealt with Input Credit and Watering out of original six sub components at several villages. Many lessons were learned, which were useful for the revision of the programme. Some lessons for other sub components were also learned in the course of the District Seedling Farm Programme implementation. The followings are major points of feedback of the Verification Study results.

- Revision of implementation method on Input Credit (condition of loan disbursement, implementing organisation, etc.)
- Specific description on improving methods and implementation method of Watering
- Some specific description on contents and implementation method of Crop Protection
- Some specific description on contents and implementation method of Quality Control of Produce
- Some revision on contents and implementation method of Crop Diversification
- Some specific description on contents and implementation method of Soil Management

5.1.2 Objectives

There are three horticultural zones in the Region such as High-input Vegetable Zone, Low-input Vegetable Zone and Fruit Crops Zone. Vegetables are mainly cultivated in the first two zones while fruit is mainly cultivated in the third zone. However, it is difficult to draw a clear boundary between these three zones as few farmers cultivate simply vegetables or fruit. As the farmers are able to select the development tools complying with their own needs for vegetable farming or fruit farming, it is meaningless to divide the programmes into vegetables and fruit. Therefore, this programme is made in such a way applicable to both farming types.

This programme requires financial and technical supports to target farmers. The programme uses a financial support tool of input credit, and technical support tools on watering, crop protection, quality control, crop diversification and soil management.

This programme would produce good results when it is integrated with other programmes. District Seedling Farm Programme is needed to support distribution of superior seedlings to fruit farming farmers and introduction of new kinds of vegetables for vegetable farming farmers. Supports by agricultural extension service are inevitable in the most cases of implementation of this programme. Therefore, Participatory Development Capacity Building Programme, especially Training for District

and Extension Officers, deeply contributes to this programme.

5.1.3 Input Credit

(1) Basic Concept

Farmers in the targeted villages are not able to acquire adequate farm input due to financial difficulty. Therefore, they are lacking the opportunity to increase their incomes. Input Credit is drawn up aiming to provide support for small-scale horticultural farmers, supporting them with the farm input e.g. seeds, fertiliser, chemicals, essential implements, etc. on credit.

Trial regarding the district director's office as an implementation organisation from the viewpoint of disseminating this micro project to various places in the district was carried out in the Verification Study, along with the introduction of joint-reliance. As a result, various problems arose, and the following favourable outputs were revealed; such as cooperative spirit arose; acquiring of agricultural technology; increase in unit yield; realisation of growing high quality vegetables and introducing new kinds of vegetables; appearance of farmers who grew vegetables twice or three times using the profit from the first credit; and so forth.

The problems arose and the favourable outputs revealed in the Verification Study brought about some lessons learned that should be important notices for drawing up this programme. Taking these lessons learned into consideration, Input Credit shall be drawn up.

(2) Principles

Principles for drawing up Input Credit are described as follows.

1) Since it has been revealed that the government organisation is not suitable in implementing the micro credit, the implementing body shall be the Community Project Management Unit (CPMU) that is a farmers' union, and the government organisation shall support and supervise the union as a body that has knowledge concerning ways to implement the micro credit.
2) The organisation of CPMU shall be firm before starting Input Credit. Therefore, it shall be strengthened through implementing other activities so as to become firm and shall start Input Credit.
3) Each farmer concerned has individual capacity, namely, some farmers have already reached the level to manage a farm credit by themselves but some farmers have not. Therefore, Input Credit shall not given to the farmers who have not reached that level, but other projects shall be given at first to increase their ability in agricultural technology. Then, Input Credit shall be given after they reached the said level.
4) Joint-reliance shall not be applied, as it does not function easily at the project area. Therefore,

the credit shall be made available only to eligible individuals, and savings as collateral shall be applied. In this case, a certain amount of savings as collateral shall be collected prior to the disbursement of the loan. Consequently, it creates a closed structure where each fellow member shall be responsible for repayment, promoting the economic incentive of the group to make exaction. It means that the savers will suffer a loss if somebody does not repay. The loanees simultaneously being savers watch strictly one another.

5) Screening is very important to select proper loanees. In order to select such loanees, a certain period shall be put for observing and assessing the candidates. During this period, other activities that require only a small budget shall be implemented, and through their implementation, the loanees shall be assessed.
6) Loan amount shall not be big for small-scale farmers. Their balance of savings as mortgage, assessed farmland and water source, and annual income shall be taken into consideration to decide the loan amount.
7) The credit is supplied only in kind, i.e., seeds, fertiliser, chemicals, sprayers and the essential implements.
8) Farmers select the items and quantities of the farm input according to their needs with the assistance of the extension officers. The contents of the input are assessed and decided by CPMU receiving the guidance of the government organisation. However, for the first credit, the maximum amount of loan shall not exceed a quantity equivalent to the cost of farm input necessary for the expenditure to cultivate 0.1 ha farmland that is said to be appropriate for the small-scale farmers in the target area for vegetable cultivation.
9) The loanees shall have stable water sources. In case of loan for vegetable cultivation, only farmers who have safe water source and who do not rely only on rainfall in the area where irregular weather is common should be considered.
10) Loanees shall grow more than one kind of vegetables, including what is not easily perishable and whose prices are not affected by market price so as to avoid risk incurred by sharp fall of the latter.
11) Extension services are provided to the loanees not only for the improvement of crop productivity and quality but also for the mitigation of negative impact to the environment.
12) Relief funds shall be planned beforehand for natural calamites, such as floods.

(3) Phased Operation of Input Credit

It is necessary to secure funds for purchasing the farm input and training costs for the capacity building of district officers and farmers who are involved in Input Credit. For obtaining these funds, including Input Credit into the budget of DADP or requesting financial support to international organisations shall be considered.

CPMU implements Input Credit with the support and superintendence of the government organisation. The District Agricultural Credit Office (DACO) that has knowledge to manage credit and support and

supervise CPMU is established in the District Director's Office (DDO). NGOs that have sufficient experience in conducting credit provide the staff of DACO with support for capacity building at the time of its establishment. DACO supports and supervises farmers to form CPMU. If there already exists a union, DACO shall support and supervise the union to change into the implementing body of Input Credit. CPMU receives the farm input purchased through the above-mentioned funds and delivers them to the farmers. The repayment shall constitute a revolving fund. The revolving fund can be applied not only to horticultural farming but also to other broad rural economic activities. Government intervention in the use of the revolving fund should be minimised.

The proposed Input Credit is introduced and implemented through the following two stages.

Stage I: Establishment of Credit Scheme and Operation by CPMU
Setting up the Revolving Fund

Stage II: Smooth Credit Operation with the Revolving Fund set up
Monitoring by the Farmers

To provide the national and regional logistic support, a Coordination Committee is set up in the Regional Commissioner's Office (RCO) at Stage I, while the farmers form CPMU with the advice and support of DACO. Subsequently, CPMU leaders are elected, who register CPMU as a group. DACO provides CPMU leaders with practical training concerning the management of the organisation and that of Input Credit.

Prior to commencing Input Credit, CPMU shall implement other activities that require only a small budget, such as group nursery, vegetable experimental plots and group farming. Through these activities, CPMU will become firm and be able to obtain data for selecting the proper loanees. CPMU starts Input Credit, with DACO acknowledging that CPMU is able to manage the activities sufficiently and its organisation is firm.

The funds for the proposed credit are to be obtained through DADP or the development organisations in kind. The funds shall include relief funds for natural calamites, such as floods. Under the Coordination Committee’s (and the development organisations’) advisory team, CPMU establishes a management system of Input Credit through a day-to-day credit operation with the support and superintendence of DACO. The District Agricultural and Livestock Development Officer (DALDO) and the District Cooperative Officer (DCO) are appointed as advisors for DACO. The repayment money is deposited in the bank account of CPMU and constitutes the revolving fund. CPMU holds periodical meetings for achieving smooth management.

The following chart illustrates the operation flow of Stage I.

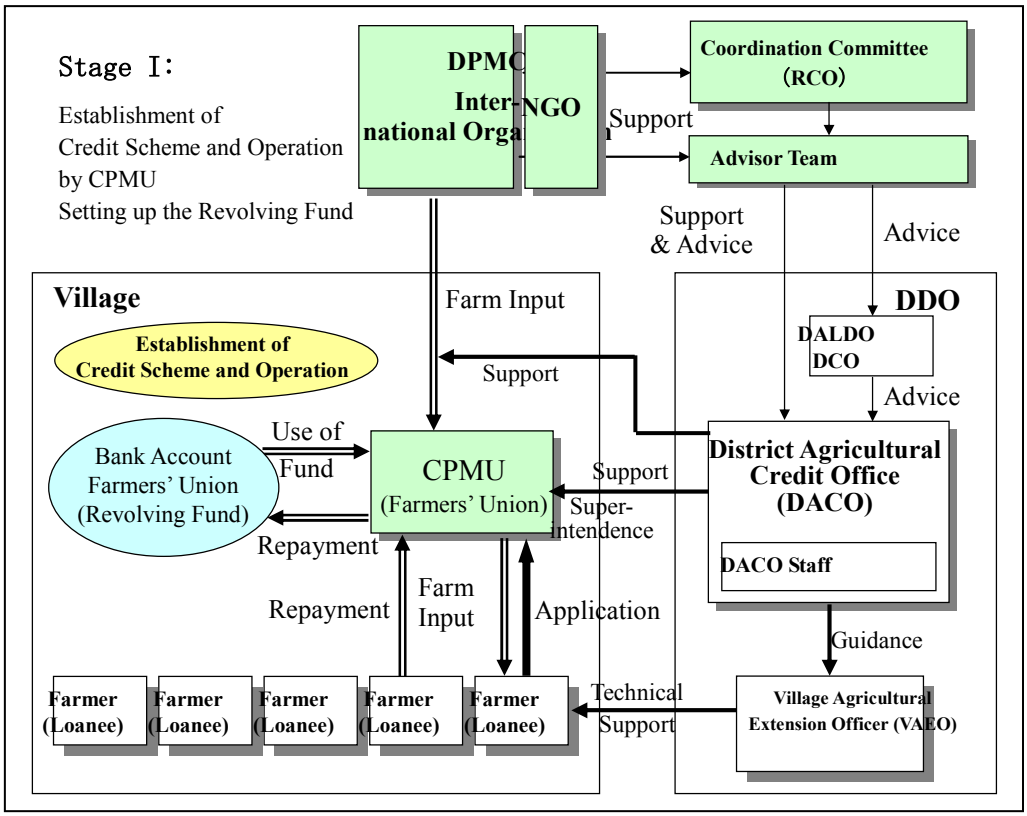

Fig. 5.1.1 Operation Flow of Stage I in Input Credit

At Stage II, CPMU implements Input Credit with the support of DACO using the revolving fund set up as described in the following chart. DACO monitors its operation frequently through the reports of CPMU and VAEO or through the investigation results of DACO staff visiting the site, if needed, and reports the monitoring result to DALDO. DALDO reports to the DDO and the Coordination Committee in the Region, and receives the checkups of the latter.

With the simultaneous monitoring by DDO, the farmers including the loanees monitor themselves on way to perform the activities and solve the problems concerning Input Credit. During the course of the operation, some modification or improvement is carried out to adjust the effectiveness and efficiency of the management. Decisions made by the farmers should be given high priority to sustain the flexible cooperative operation.

DDO shall disseminate Input Credit to other villages after confirming the possibility of its smooth implementation by CPMU. For the dissemination, DDO shall secure the budget of Input Credit in DADP or request financial support to the development organisations, and form CPMUs in the new villages. In the mean time, RCO shall disseminate Input Credit to other districts with the collaboration of DACO who has the experience to implement Input Credit. For the dissemination, RCO shall assist the other districts to establish DACOs.

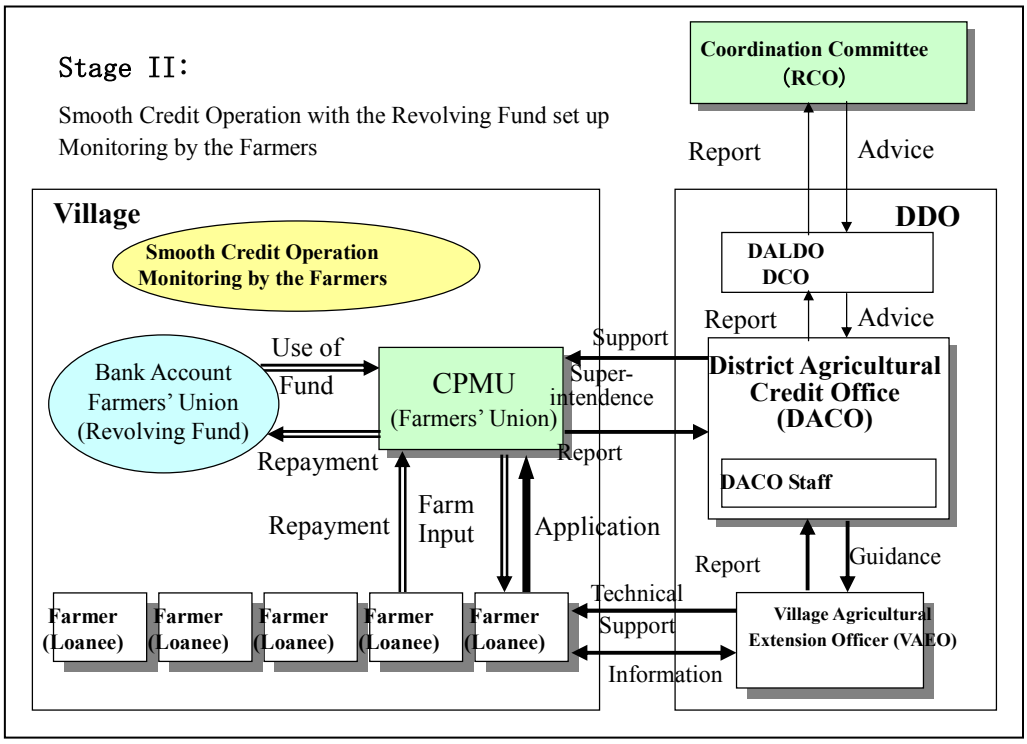

Fig. 5.1.2 Operation Flow of Stage II in Input Credit

(4) Operation Cycle

Since farmers themselves carefully select the harvesting period of vegetables, taking into account marketability and price fluctuation, the credit should be made available anytime throughout the year. However, the credit operation shall be seasonal at Stage I in order to simplify the operation at the initial stage of the micro project, therefore the operation cycles are made twice a year for the crop seasons starting in June and October. With the progress of capacity building of project staff and farmers, the operation system is made more flexible to meet the farmers' actual needs, and the farmers are able to procure the farm input depending upon their farming schedules at Stage II.

(5) Interest, Savings and Charges

The prevailing micro-credits in Tanzania put conditions on loanees to start repayment in the 6th month after onset of the loan disbursement and to complete within six months time. The loan interests range from 12.5% to 15% per 6 months after the onset of the credit disbursement. The farmers shall decide the proper conditions of Input Credit, such as interest rate, membership fees, insurance, and so forth. The decision shall be made after acquiring knowledge concerning the conditions of the loan on why CPMU needs them for managing the credit sustainably only with the revolving fund.

Concerning the loan amount, though the farmers themselves shall decide it at last, the following condition is recommended for its decision.

The loan amount to be disbursed to each loanee shall be decided after fulfilling the following conditions.

i. For the first credit, the maximum amount of the loan shall not exceed a quantity equivalent to the cost of farm input necessary to cultivate 0.1 ha farmland.
ii. The loan amount shall not exceed the double of the saving.
iii. The loan amount shall not exceed a quality equivalent to the cost of farm input to cultivate the assessed farmland with the assessed water source.
iv. The loan amount shall be decided taking the annual income into consideration.

(6) Operation Flow

The operation flow of Input Credit is listed below.

1) The advertisement of explanatory meeting is announced on the village notice board. The information to be provided includes the followings.
   i. Savings as collateral needed before credit disbursement
   ii. Conditions, such as interest rate, membership fees, insurance, and so forth
   iii. Eligibility for receiving credit (water availability, experience of vegetable cultivation)
   iv. Maximum loan amount
   v. Delivery date and repayment period
   vi. Others
2) The explanatory meeting to explain the above-mentioned conditions is held.
3) The farmers start savings and attend the periodical meeting immediately after they decide to get the loan.
4) CPMU provides the farmers with awareness creation training for conception of Input Credit, especially concerning the perception that the loan is not a gift and is to be absolutely repaid, with the collaboration of DACO.
5) After they save a certain amount of money, the farmers decide the cultivation plan not exceeding the maximum amount of the loan and submit the applications.
6) CPMU assesses applicants' farms, water sources and the contents of the application with the collaboration of DACO, and selection of the loanees is carried out simultaneously. For assessing the farmers' capacity to secure water, do not believe their statements straight, and once some doubts are arising, stop pledging credit. The selection of loanees shall be strict by means of observing and assessing the candidates through the other activities, and confirming their results with other information.
7) CPMU makes a written loan agreement with each farmer who has passed the assessment.
8) CPMU purchases the farm input in accordance with the agreement and deliver it to the farmers (loanees).
9) The loanees grow vegetables with the technical support of VAEOs.
10) The loanees repay after they harvest. CPMU secures the repayment money in its bank account to be the revolving fund.

(7) Others

In this micro project, the poor are defined in three categories as follows;

- The poor of the poorest (who needs donation or grant)
- The poor (who can have substantial but not more than that)
- The active poor (who can have substantial and be able to keep a little money for future use)

In principle, considering the active poor as the target, this micro project was drawn up. In the case of applying this micro project to the poor, it is inevitable to set the maximum loan amount extremely small.

For the poor of the poorest, the method of group farming as described in the following is proposed.

- CPMU prepares the farm for growing vegetables, by renting or any other means. The scale of the farm shall be around half an acre or less.
- CPMU recruits the farmers among the poor of the poorest to work for growing vegetables at the farm. Candidates can be unskilled in vegetable growing as long as they have strong desire.
- CPMU prepares the farm input using the revolving fund for cultivating vegetables there.
- The recruited farmers grow vegetables at the farm in accordance with the working schedule prepared by the union.
- The farmers acquire agricultural technique with the collaboration of VAEO through the daily farming work.
- CPMU sells the harvests produced from the farm. CPMU repays the loan with the interest and secures expenses budget from the income. The remaining amount is delivered to the farmers in kind. (The more they harvest, the more they earn.)
- The minimum labour fee is guaranteed by CPMU, and is the farm input for cultivating 200 m^2.

5.1.4 Watering

In some villages, especially categorised into High-input vegetable zone and Low-input vegetable zone in the Study Area, improvement of crop watering, which is one of physical upgrading in horticulture practice, seems to be essential for fulfilling a development target. For these areas, improvement and advancement of crop watering must be the key tool for success of Community Based Horticultural Development Programme.

As described in the development concept of the Master Programme, Community Based Horticulture Development Programme heavily relies upon a spontaneous development through self-reliance of farmers. Accordingly, the improvement of crop watering should be projected and accomplished not with extensive hardware installation, but with simple facilities harmonised with local conditions and should be based upon farmers' initiative through establishing an Action Plan by themselves. The

Master Programme for improvement of crop watering does not intend to cover the whole Study Area. However, each village where it is required is proposed to make its own improvement plan following the basic policy.

As a means of improvement of crop watering based upon farmers' initiative that the farmers are able to carry out by their own capability with the collaboration of district officers, watering using small pumps in groups is proposed. Additionally, watering with a longer interval that enables water saving and labour reduction is also proposed. These possibilities were acknowledged through the Verification Study.

(1) Watering using Small Pumps in Groups

The farmers in the Study Area stress the inconvenience of fetching water. Water is transported using polyethylene tanks from water sources such as ponds, Kisima and rivers to the farm for watering. This work is one of the heaviest for them since they have to go back and forth between the farm and the water sources many times. To improve this situation, the farmers strongly desire to have pumps. However, pumps are not popular due to high initial cost and difficulty to acquire optimal small pumps for small farms individually.

Small pumps are introduced to ensure stable farming that is not affected by weather, increase of crop yield and reducing the labour of water fetching. Prior to introducing the pumps, groups shall be formed, and the members of each group collaborate to decide a watering plan, then the suitable pump will be procured in accordance with the plan drawn up. This way would save initial cost per farmer and create a sense of ownership on the facilities as well.

The members also carry out operation and maintenance of the facilities jointly after the acquisition of the pumps, contributing in promoting group activities. Irrigation farming requires farmers' collaboration on maintaining joint facilities, as the water source is limited. In the Study Area, the farmers need not to make group work at present, as they water using polyethylene tanks individually. However, after introduction of the pumps, the group work is inevitable. Moreover, such group activities make the access to government services easier.

Summarising the effects of the Verification Study on this micro project, they brought about the following outcomes; such as increase of possible watering area with reducing the labour; acquisition of agricultural technology through the extension officers who have became more intimate; abatement of structural poverty through group activities; materialisation of year round watering using pumps; and so forth. Additionally, the positive interaction with other micro projects was observed.

As a result of the Verification Study, the followings were ascertained to be taken into consideration for

implementing this programme.

- Engine pump is effective, providing that water source is perfectly secured. However, some more conditions are needed to make this programme to be successful. The conditions are farm input shall be properly prepared, the group members are honest to work together and leadership shall be strong.
- The farms of the groups shall be located at one place, and the groups can monitor progress of cultivation and yield, and income and repayment for the pumps one another.
- Treadle pumps shall be recommended for limited water sources with small amount of water, since engine pumps are too big in capacity. In this case, there is a possibility that using treadle pumps acquires more time and effort on watering than using polyethylene tanks. Therefore, it is better not to use the treadle pump directly for watering crops. When the treadle pumps are introduced, they shall be applied for such case as watering crops at farm far away from the water sources. In this case, a reservoir shall be made between the source and the farm, and the water shall be conveyed to the reservoir by the treadle pump. Subsequently, the crops are watered using polyethylene tanks. For introducing this method, even for small-scale facilities, once permanent ones are included in the project, the land ownership shall be grasped before planning, since the problem of land ownership arises.

(2) Watering with a Longer Interval

The farmers in the Study Area are using polyethylene tanks for watering. The watering is normally carried out everyday. According to calculation done by the Team, it was revealed that everyday watering supplied too much water as the water requirements. Trials were carried out in the Verification Study to find whether watering interval could be prolonged. As a result, it was observed that the vegetables grew properly even with watering every other day as long as the temperature was not extraordinary high. Subsequently, there appeared farmers who practiced watering twice every three days in the final year of the Verification Study, and they got a proper yield.

It is necessary to take flexible measures as changing watering interval to everyday or even more when the temperature is extraordinary high.

5.1.5 Crop Protection

The horticultural crop production in the Region is likely to have pest and disease damages on plants due to its humid tropical climate. There are two types of measures for pest and disease control with and without agro-chemicals. The proper methods on crop protection, generally, shall be disseminate to farmers through normal extension channel. The agricultural extension system should be strengthened to achieve this target by using the Capacity Building Programme.

The proper use of agro-chemicals is a future target for the high-input vegetable growers, who already use agro-chemicals to vegetables. It is important to make necessary guidance to farmers in implementation of Input Credit. Also certain tests on effect and use of agro-chemicals should be carried out within District Seedling Farm Programme and the results shall be used in extension services. Furthermore, the organic insecticides, which can be prepared by local farmers themselves, should be considered as an alternative way, taking into account the difficulty for them to buy manufactured chemicals. An hopeful organic insecticide is the Neem tree (*Azadirachta Indica*), where the mixture with dried and grinded seed and soap water is spayed to vegetables to kill or prevent many kinds of insects.

Most of the farmers do not use agro-chemicals on vegetables. For the fruit crops except cashew, limited farmers use agro-chemicals only for young trees. Such farmers are recommended to adopt cultural methods of the crop protection, judging from their technical level and market conditions. The main cultural control of pests and diseases are listed below. Some methods are more effective when the farmers' group takes the same action at a certain extent of farmland. This crop protection should be carried out through the strengthened agricultural extension services. The experiments and demonstration on crop protection techniques should be implemented effectively in District Seedling Farm Programme.

- Planting crops at the optimum time: It is recommendable to plant each crop at the right time in order to get good growth and good yields. Early-planted crops usually grow more vigorously than late-planted ones because of lower population of disease and other pests.
- Field hygiene: All plant residues and seed lying about from an infected crop should be destructed and burnt soon after the completion of harvesting. For trees, cutting off and burning of damaged or diseased branches is essential.
- Close season and crop rotation: The close season, which is a particular season when nobody is allowed to grow given crops, aims at breaking the life cycle of the pests. Crop rotation also controls these pests by breaking their life cycle and also by resting land under completely different crops.
- Weed control: Weeds, which may harbour pests and diseases, should be removed from farmland including orchard.
- Use of 'clean' planting materials: All planting materials, including seeds, cuttings, rootstocks, scions and even buds, must be free from all possible disease and pests to ensure a healthy start for the plants. The resistant varieties should be introduced, if possible.

5.1.6 Quality Control of Produce

Individual farmers manage quality control of the horticultural produce by their own judgement at present, as producers or traders have not set any standards of vegetables and fruit. The proper quality

control of the produce is recommended to trade their produce in favourable conditions when the production amount of the certain crop from the area becomes large enough. Standardisation of variety and quality is effective only when the marketing system is improved to accept such qualified produce. For the standardisation, the farmers should prepare grading places, storage facilities and proper containers.

A plausible short-term implementation method could be mixture of Input Credit, Capacity Building and District Seedling Farm Programmes. The improvement of quality and production of vegetables could be achieved in group application of Input Credit. The profitable kinds or varieties of vegetables should be selected and the proper crop husbandry method should be established in District Seedling Farm Programme. Further, the Capacity Building Programme is effective in the extension services of these new methods.

5.1.7 Crop Diversification

Diversification of horticultural crops is very important to reduce the risks caused by those unreliable marketing prices and unstable yield. The smallholder farmers in the high-input vegetable zone usually cultivate several kinds of vegetables in their farm plots, reducing such risks. On the other hand, the farmers in the low-input vegetable zone plant only a few kinds of vegetables for the commercial purpose with some risks. This is the reason why they do use little farm input. However, the crop diversification should be introduced to such farmers to minimise the risks in future. Only the private small traders in the Region supply the limited kinds of vegetable seeds at present. The supply system of the seeds should be improved to expand the farmers' selection.

The vegetables to be introduced should be investigated concerning their adaptability to the local conditions, and then distributed to the farmers with the necessary knowledge, technique and materials through agricultural extension system. The possible kinds of vegetables are those imported from other regions to the villages, such as onion, carrot and potato, and also those to be marketed at high prices in urban areas, such as melon and garlic. Considering farmers' intention and market needs, the district agricultural officers and extension officers at the District Seedling Farms should carry out the crop adaptability tests. It is also very effective to implement small scale tests at the vegetable experimental plots in several villages supported by the extension officers.

The results of the experiments in the Verification Study shows that onion, carrot and garlic are able to grow during the cool season, and have a higher market value. The farmers in the tried villages willingly accepted the new cultivation of such preservable and profitable crops. The farmers in and around the experimental plots have tried to produce them more by themselves.

The diversification of cropping schedule is another way for the vegetable development, relating to improvement of watering. The off-season cropping is high risk, such as short rainfall, high humidity and high temperature, but high return of higher price of produce. The off-season vegetables are expected to make profit even though the cropping cost is higher than the normal due to the cost of pump or agro-chemical. Such trial has already been made in several villages in the Verification Study.

As for fruit, some improved varieties are to be introduced to the smallholder farmers. Since most of farmers pay money only to seedlings throughout the production process of fruit, it is a possible way toward fruit development to replace local seedlings with improved seedlings. The distribution system of the seedlings is to be undertaken by district governments under District Seedling Farm Programme. It is also recommended that the farmers' groups propagate such fruit seedlings by themselves under suitable extension services.

Considering the domestic market condition of fruits, common fruits, such as mangoes and oranges should be improved by the introduction of high quality varieties as well as early or late maturing varieties, because their market price is very low during the high season. Further, the tropical fruits growing limitedly in Zanzibar, such as Rambutan, should be introduced to Coast Region where the rainfall is relatively high in Tanzania mainland.

5.1.8 Soil Management

Increased use of organic fertiliser is generally recommended for vegetable cultivation. The application rate of 20 ton/ha is the standard rate of farmyard manure in the tropical conditions. The farmers in the Region often use crop residue as green manure, but seldom use farmyard manure so far. The production and distribution of farmyard manure need to be developed in future, together with livestock development. Although the standard application rates of fertiliser may vary with crop requirement and soil fertility, farmers in the Region apply fertiliser on this rate as basal dressing, and put additional fertiliser when necessary.

For fruit production, almost all farmers except plantation-style large farmers do not use any fertiliser. Limited number of farmers put chemical fertiliser three times a year, i.e., half amount in the dry season, small amount at early fruiting stage and the rest after harvesting. Common farmers may use only farmyard manure once at the planting of seedlings.

The standard application rates of chemical fertiliser and effects of continuous organic manure application should be examined at the experimental farms under the District Seedling Farm Programme. The extension officers disseminate such experimental results to their servicing farmers, supported by the Capacity Building Programme.

In addition, some sloping farmland requires soil conservation measures to reduce topsoil erosion. Measures, such as contour cultivation, mulching and water harvesting, are to be investigated and introduced by the extension service system. The demonstration farms, where some conservation methods are investigated and demonstrated, are very effective in awareness creation and technical study of farmers. In this way, the district agriculture office shall provide necessary materials and technical guidance, and villagers shall provide labour for land reclamation.

5.2 Participatory Development Capacity Building Programme

5.2.1 Feedback of Verification Study Result

The Team carried out sub-components of Part 1, 2 and 3 of the original Master Programme in the Verification Study. In Part 1, stress was put on the empowerment of extension officers who stand between administration and villagers to resolve the structural poverty. Emphasis was laid on the interchange of opinions among group leaders in Part 2. Villagers' empowerment was expected in Part 3, creating their awareness through planning, construction and management of multi-purpose shed and mill house carried out under the leadership of villagers.

Achievement of capacity building, as a whole, was successfully accomplished in the Study. Even the management of milling did not work smoothly due to troubles of machines and less customers than expected; the awareness creation was achieved to a great extent. Therefore, the original programme is not necessary to be revised a lot.

5.2.2 General

The great emphasis is placed on the capacity building of the government staff as well as the communities to ensure effective and efficient project implementation and further development activities. This is because adequate follow up is of the utmost importance even after completion of the Project. Therefore, the programme is formulated to encourage Training of Trainers (TOT) by a full use of internal skills available in the Region rather than provision of passive training courses only by expatriates. Their basic concepts of the programme are On-the-Job Training (OJT) and Learning-by-Doing. Participatory Development Capacity Building Programme consists of the following three parts with a close linkage to each other. These three parts are not independent, but are intertwined and reinforced each other and contribute to the improvement of structural poverty, the training of leaders and the empowerment of community. Strengthening of administration as a promoting body is carried out in this Programme taking into consideration the sustainability of the projects.

Part 1: Training for District & Extension Officers
Part 2: Training for Group Leaders
Part 3: Community Awareness Creation

The Regional Commissioner's Office takes full responsibilities in Part 1 for training both district and extension officers. Part 2 is promoted under the initiatives of the District Offices. For this purpose, PCM and PRA specialists are trained up from the district officers under Part 1. Part 2 is envisaged to promote the leadership training. The group leaders trained under Part 2 play important roles in Part 3 being supported by extension officers at village level.

In the case that donors and NGOs assist the entire course of the programme, they dispatch an advisory team, which ensures professional guidance and supports. An advisory team is proposed to consist of (i) Institutional Expert (Leader), (ii) Participatory Development Specialist and (iii) Horticultural Expert.

Under the three parts mentioned above, the following 16 sub-programmes are formulated taking into account the training aspects essential not only for the project implementation but also for promotion of any of rural development activities for poverty alleviation. Details of these sub-programme are attached in the Attachment.

Part 1: Training for District & Extension Officers
1-1 Preparation of Training Materials
1-2 Seminars and Workshops
1-3 Training Courses for PCM Moderators and PRA Facilitators
1-4 Skill Training of Horticultural Farming Techniques
1-5 Training for Management Techniques of Community-Based Horticultural Development Programme
1-6 Training for Management of Participatory Rural Development Projects for Poverty Alleviation
1-7 Training for Project Benefit Monitoring and Evaluation (PBME) Techniques

Part 2: Training for Group Leaders
2-1 Preparation of Training Materials
2-2 Seminars and Workshops
2-3 Skill Training of Horticultural Farming Techniques
2-4 Leadership Training in Group Leaders' Committee
2-5 Training for Group Operation through Actual Activities with Members

Part 3: Community Awareness Creation

3-1 Empowerment of Poverty Group including Women and Youth
3-2 Group Formation and Establishment of Group Operation Rules
3-3 Participation in Small Scale Horticultural Development Project
3-4 Promotion of Group Activities by means of Community Facilities

5.2.3 Part 1: Training for District and Extension Officers

Training for District & Extension Officers in Part 1 aims at capacity building of DOs, WAEOs and VAEOs. Under the on-going local government reform, the roles and responsibilities of the district offices are rapidly expanding. The roles of DALDO and his/her agricultural staff members play extremely important roles in agricultural and rural development in the Region where agriculture is a mainstay of the regional economy by absorbing over 80% of the regional population.

District Offices (DOs) are required to control effective administrative and logistic supports for the communities. DOs have to be able to plan, design, budget, implement, operate, maintain and monitor development projects, although some process yet needs some arrangement with the central and regional governments to fit DOs' activities to the conditions set under the current local government reform.

The capacity building for the local government is broadly categorised into two (2) sections, namely (i) technical skilfulness and (ii) administrative and logistic supports. As for agricultural skill training, the substantial parts are covered by National Agricultural Extension Programme II (NAEP II, 1996-2001). Since the NAEP II attaches more priority to staple crops rather than horticultural crops, however, few extension officers are specialised with horticultural farming in the Region. Therefore, the Part 1 focuses on the skill training for horticultural farming among the extension officers. District Seedling Farm Programme functions not only as fruit seedling sources but also simple demonstration farms for establishment of standard farming practices and crop (variety) selection, which are to be transferred to local farmers though the extension channel.

The administrative and logistic supports to local farmers are under full responsibilities of DOs. The channel of communication between the government and the communities needs to be strengthened. Part 2 proposes to introduce more positive participatory development activities at the village level in association with the government staff. In this regard, the PCM and PRA techniques are believed to be the most suitable tools. Local government staff and villagers discuss, learn from previous lessons and try to find out approaches to solutions through PCM and PRA. For this particularly important objective, PCM and PRA training is promoted under Part 1. For the training, making good use of NGOs, experienced in rural development with conducting participatory methods, is effective.
One of the reasons of the stagnation of rural development is judged at the lack of communication

between community and administration. Therefore, the Verification Study offered frequent opportunities to accelerate the interchange of opinions and experiences between community and administration. Representatives of the farmers participated in every meeting like Steering Committee Meeting, Joint DPMC Meeting and DPMC Meeting. The representative farmers and District officers heading by DALDO discussed frankly in the DPMC Meeting held every other month. Together with these meetings, the frequent visit of district officers to the villages brought about the reduction of structural poverty to a certain extent. The reduction of structural poverty resulted from the activities of all the three Parts, and this movement is very important to implement the Master Programme.

As a result of the Verification Study, the followings were ascertained to be taken into consideration for implementing this programme.

- The budget of district is too small to continue the training. On the other hand, provision of transport means, especially fuel for motorcycle, necessary for the daily extension work is inadequate, and the extension officers cannot make good use of the result of this project. Therefore, it is indispensable for the districts to secure such budget.
- Though training in community development was given to help extension officers to build up their capacities in handling community matters, the extension officers concentrated more in giving technical advices rather than supervising community activities. Equal weight has to be given for both activities.
- It shall be considered a large amount of new materials shall not be delivered to the trainees in a short course. Training curriculum should be planned in accordance with the length of the course.

5.2.4 Part 2: Training for Group Leaders

As group leaders are driving forces of micro projects' implementation, leaders' ownership creation is essential for the projects' successful achievement. Therefore, training for group leaders is very important, and it is important indeed for them to be familiar with thinking together by interchanging opinions. It helps to build their capacity on awareness of problems and their solution.

Training for Group Leaders is conducted under the control of DOs. PRA is employed at village level as a tool to motivate group leaders including candidates. They are expected to learn the following aspects through actual community planning by PCM and PRA.

- Concept of community based development
- How to identify problems farmers facing in a community
- How to motivate farmers to join a group formation
- How to lead farmers to community based development
- How to reach disadvantaged people and creates awareness

In Part 2, attempts are made to involve target groups in decision-making and ownership of project. In

most of the development projects, they tend to end the programme and services when a project phases out. Capacity building is the utmost important to enhance sustainability of participatory development project, in this context.

Part 2 is conducted in parallel to Community Based Horticultural Development Programme, in which the proposed Input Credit and group activities are promoted. This combination facilitates accumulation of more pragmatic experiences among community and group leaders simultaneously. In particular, the following leadership spirit and skills are cultivated under both programmes.

- Self discipline and cost effective group operation
- Cultivating sense of ownership and building responsibility to stakeholders
- Standardisation and uniformity of operations
- Strengthening solidarity bonding
- Getting more power in negotiation for various services
- Sharing of experience and knowledge
- Identifying gender gaps in access to labour and technology
- Timely loan repayment
- Transparent accounting and record keeping

Part 2 focuses on improvement of channels of communication between District Offices and rural societies. In this regard, frontline extension workers and group leaders are expected to play roles as interface for both sides. Part 2 proposes that the skill training is carried out at District Seedling Farms together with the training programme for extension officers to create close relationship between both groups.

5.2.5 Part 3: Community Awareness Creation

Community Awareness Creation aims at reviewing quality of life among villagers. The programme for villagers is formulated to tackle poverty alleviation by uniting their efforts in evaluating their past efforts and in planning new initiatives to solve common social problems. Solidarity of group members is believed to strengthen power of individuals in fighting poverty. In order to promote solidarity, villagers make an attempt to identify their rules and traditional customs to accommodate each other. In the process, they are to be made aware of democracy in both form and content. The programme of Community Awareness Creation finally envisages strengthening solidarity and equity in their community.

Part 3 promotes participatory community planning by the PRA specialists from District Offices with WAEOs and VAEOs. PRA is carried out according to the following procedures.

- Review of past meeting records of Village Assembly

- Transect walks
- Participatory village resource mapping
- Focus group discussion
- Preliminary participatory planning

Prior to PRA, the past meeting records are reviewed by DOs and an advisory team in order to clarify development constraints and needs among the villagers. The advisory team includes experts from a donor side, if funds are raised from the donor. It is recommended to avoid focussing only on the issues arising from the assembly. Anticipated goals of Part 3 are (i) empowerment of farmers and (ii) formation of close relationship between community and the government staff.

The extension officers acquire special knowledge on the communities through Part 1. Their performance of assistance with sufficient experience is essential in terms of awareness creation of farmers. Additionally, the awareness creation is to be more effective with the assistance from experienced NGOs. The farmers become to identify more problems not only in crop production but also in daily water supply, education, medical issues, and so forth, and to move for their settlement.

"Farmers' Empowerment" has been performed through Farmers Training, Group Leader Training, Construction of Community Facility, Experimentation Plot, etc in the Verification Study. Farmers were empowered while they spontaneously carry out these micro projects. Especially the enforcement of such big projects like a multi-purpose shed and a milling machine projects were useful, as they brought the community people self-reliance after completion of the project.

The improvement of "the socio-cultural constraints concerning community and local government or the reduction of structural poverty" has been done through community and administrative agency working together in the part 1,2 and 3 sub-programmes during the Verification Study. Regular meeting of DPMC between farmers and administrative agency has also got rid of the constraints.

As a farmers training and a group leaders training was found to bring big fruits with small cost, districts can carry out these projects within its capacity.

A multi-purpose shed and a milling machine, that is useful as a tool of "villagers' empowerment", requests an initial investment. Therefore, it is difficult to construct the facilities without the financial assistance from the government. However, since there is a case that the farmers constructed a shed with wood and soil, it can be said that the villagers construct it without any outside assistance, if they really require.

Administrative agency should continue to tackle the reduction of structural poverty.

5.3 District Seedling Farm Programme

5.3.1 Feedback of Verification Study Result

The major components within the preliminary District Seedling Farm Programme were implemented in the Verification Study. As the effectiveness and relevance of the components were proved, the original framework of the programme can be adopted. The Verification Study clarified that the group nurseries and experimental plots can give significant impacts to farmers and be operated by the district offices easily, although these were originally set as supporting components to district-operating farms. The Study also disclosed that the district seedling farm needs large initial cost and certain time (3 to 5 years) to establish a self-supporting accounting system. The major feedback of the Verification Study results is listed below.

- Revision of accounting balance of district seedling farm
- Additional explanation on group seedling farms
- Additional explanation on experimental plots
- Revision of implementation method of the programme

5.3.2 Outline of District Seedling Farm Programme

The objectives of District Seedling Farm Programme are;

1) production and distribution of improved fruit seedlings,
2) demonstration of advanced horticultural techniques,
3) research on fruit and vegetable production, and
4) provision of training facility for extension officers and exemplary farmers.

The measures to realise those objectives are;

1) to establish and operate district seedling farm,
2) to support group seedling farms in operational and technical aspects, and
3) to implement vegetable experimental plots in selected villages.

The district agricultural offices shall implement them from higher priority measures with necessary technical support from the Ministry of Agriculture and Food Security (MAFS) and Sokoine University of Agriculture (SUA) and also financial support from district government, donors or NGOs. The final target is to implement all measures under the leadership of the district seedling farm in every district. The entire figure of the District Seedling Farm Programme is shown below.

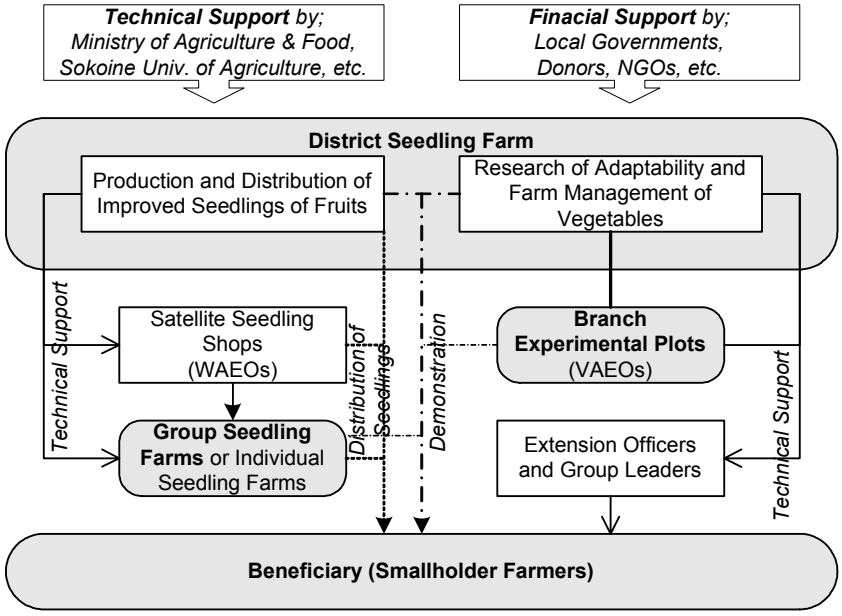

Fig. 5.3.1 Proposed Functional Structure of District Seedling Farm Programme

5.3.3 District Seedling Farm

(1) Contents of District Seedling Farm

Total five district seedling farms (one for each district) are established or rehabilitated in the Region in a long period under assistance to initial investment and technical support by some supporting organisations. The main function of the district seedling farms is production and distribution of high-quality fruit seedlings. Most fruit growers prefer improved seedlings with characteristics of high-yielding, high-quality, early- or late-maturing and disease tolerance, but it is difficult for common farmers to get such seedlings at present. Most farmers raise seedling by themselves or purchase them from their neighbours. Advanced technique and easy access to improved seedlings are necessary for them. The target fruits are generally coconuts, citrus, mangoes, passion fruits, and cashew nuts, but they shall be decided on the necessity by the responsible district. Although the production and supply plan of the seedlings has to be formulated taking the local demand into account, the target number of the total seedling supply is tentatively set at 20,000 a year. Several varieties of fruit trees are planted in the orchard area as mother trees to provide scions and rootstocks on grafting. The certified seedlings are purchased at SUA and some institutes of MAFS, then planted and multiplied in the orchard. SUA as well as MAFS provide the technical support to the district specialists.

For the distribution of seedlings to the remote areas, the WAEOs and VAEOs play key roles. The extension officers, at first, inform their farmers of the advantages to plant such improved seedlings. The produced seedlings are sold to the smallholder farmers at the district seedling farms themselves and satellite shops managed by the WAEOs. The seedlings are distributed to the satellite shops and the WAEOs multiply them near the shops as their requirement. The multiplication by farmers' groups is

also recommendable under technical support by the extension officers.

The farmers purchase the certified seedlings at the reasonable prices that are set at the same rate as the local seedlings, taking the farmers' purchasing power into account. Together with the seedlings, the extension officers provide some plain technical guidance. The beneficial farmers plant the seedlings between old trees in order to keep their production until the fruiting of new trees. Then, the old trees are cut down for replacing with the new trees.

Apart from fruit crops, the vegetables are planted on the experimental plots attached to the seedling farms for the crop adaptability test and the demonstration. The district specialists investigate the adaptability of the new kinds or varieties of vegetables, and examine the appropriate farming methods in the course of the experiments as well. The experimental farms demonstrate advanced technique such as appropriate spacing, organic or chemical fertiliser use, disease control, integrated pest management, watering, and soil conservation. For this purpose, it is highly preferable to set up several branch experimental farms in the various agro-ecological zones.

At the establishment of the seedling farms, the farmland and working space are to be prepared tidily. The district seedling farm requires an office lot, nursery garden with shade/net house, orchard for mother trees and experimental plots for vegetables. The farms are to provide with necessary equipment and materials, such as farming tools and materials, experimental equipment, transport facilities and so forth. The farms should be equipped with weather observation instruments.

(2) Operation and Management of District Seedling Farm

The district governments are the implementing agencies of District Seedling Farm Programme. The district offices, Donors or NGOs arrange the necessary funds for facilities and equipment at the initial stage.

The core staffs required for the farm are a farm manager and a horticulturist permanently assigned by each district. District Executive Director (DED) or District Agriculture and Livestock Development Officer (DALDO) plays a roll of supervisor of the farm, and Ward and Village Extension Officers (WAEOs and VAEOs) are supporting staff in the farm operation. Under the circumstance that a donor or NGO could support this farm, the donor or NGO dispatches a programme leader and an agronomist at the initial stage. In this case, the regional government functions as a coordinating agency between the donor/NGO and the district government. The organisation structure District Seedling Farm is proposed as shown below.

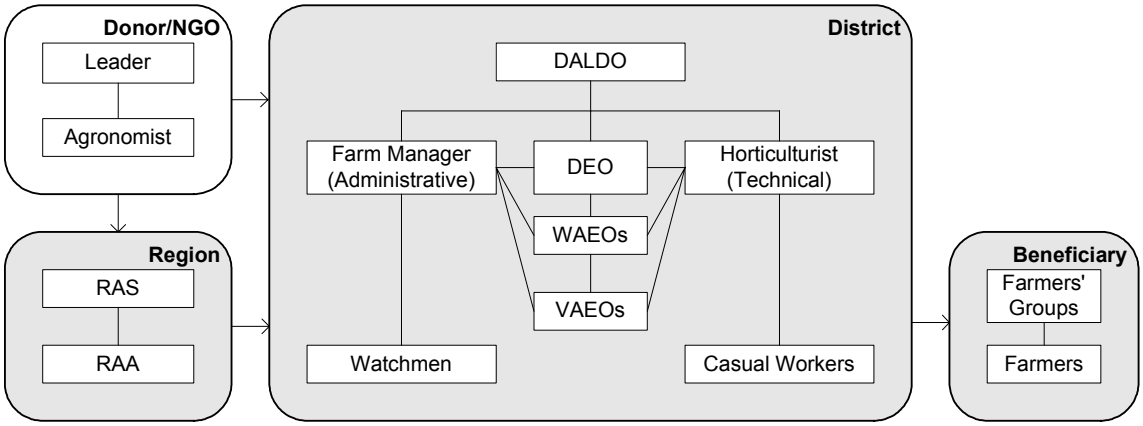

Fig. 5.3.2 Proposed Organisational Structure of District Seedling Farm

The earnings from the sales of fruit seedlings and other farm produce are to be properly used for an operation and also loan repayment on the farm, if necessary. The farm should prepare an independent bank account to separate from general account of district. The farm aims at a self-supporting accounting system, as it is difficult to get the financial support from district general budget.

The preliminary financial analysis was made in order to evaluate sustainability of District Seedling Farm Programme. Zegereni farm in Kibaha District was taken for this analysis as a model case. As a result mentioned in section 4.6.6 (1), the Zegereni farm should reduce the monthly operation cost at TShs 300,000 and concentrate to produce high value vegetables and fruit seedlings to achieve self-operation. Therefore, the district governments is expected to operate their seedling farms by their sales income only, as far as they do not have to repay for the initial investment and technical cooperation from the international organisations.

5.3.4 Group Seedling Farm

The group seedling farms or group nurseries are small-scale seedling farms within the District Seedling Farm Programme. The main objective is to produce high quality fruit seedlings at village level, as a supplemental production of district seedling farm.

The farmers' groups shall be supported mainly in establishment and operation in the Capacity Building Programme. To keep and expand the effect of the trainings, the district officers and extension officers should continuously support the groups. The groups should report their activity and consult their difficulties in the periodical meetings among the members or together with district agriculture offices or district seedling farm. The farmers' groups do not need to register officially in the early stage. Along with the expansion of their activity, the groups should register as cooperatives, and then they should make formal reports on work plan, achievements and accounting.

In the technical matters, the district agriculture office or district seedling farm should provide technical training to the group members, because the groups need certain techniques, which need special knowledge and experience, on preparation of rootstocks, grafting and budding, and management of seedlings. The technical training should be carried out with demonstration and exercise at the district seedling farm or farms of the groups.

The district offices may have to provide financial support to the groups, as a grant or credit, because the groups need tools, equipments and materials especially for seedling production, such as seedling pots, secateurs, knives, watering cans, sprayers, agro-chemicals and scions. The cost should be covered by the annual budget of the district, or donor/NGO.

The groups should plant the produced seedlings in their own farmland as mother trees to take scions or buds in the future. They also sell surplus of the seedlings to others and use the sales income for the next operation cost. The groups aim at self-supporting operation without financial support within three to five years.

5.3.5 Experimental Plot

The experimental plots are small farms established in villages in several agro-ecological zones to implement vegetable cropping tests and also to train and demonstrate proper cropping methods. Especially the crop adaptability tests are to be carried out in the similar conditions to target areas.

The general plan shall be prepared by district agriculture office or district seedling farm, and selection of sites/operators and guidance shall be made mainly by VAEOs or WAEOs. These processes are expected to be carried out in line with the Capacity Building Programme. Although many experimental plots are preferable to be established, a suitable number may be six sites in a village at the maximum according to the Verification Study. The size of each plot should not be larger than 100 m^2 in consideration with budgetary capacity of district governments and labour input of operator farmers.

The crop adaptability tests should be implemented at the early stage, because they do not need very accurate data recording and can be done by the farmers easily. The more skilled farmers shall take charge of more complicated tests such as fertiliser tests, which need accurate data taking. The district seedling farm is expected to make the same tests as experimental plots for the purpose of crosscheck on the records.

The equipment and materials for the cropping tests shall be provided gratis by district agriculture office or district seedling farm. The operator farmers shall give farmland and labour, and get harvest.

They shall work at their plots from land preparation to harvesting under the guidance of VAEOs or WAEOs, and submit their working records and production data. The district agriculture office or district seedling farm shall accumulate the records and data, and analyse them. Those data and information are expected to be used effectively by the extension services in the wider areas.

5.4 Rural Transport Improvement Programme

5.4.1 Objectives

For the development of horticulture, the improvement of roads, especially district roads and feeder roads, is a prerequisite. The present road conditions in the Study area have been critically affected by lack of adequate maintenance and a notably deficient progress in new road construction. In the light of this critical situation, this programme puts emphasis on the improvement of the operation and maintenance of the existing roads. Moreover, the programme deals with district and feeder roads that directly affect horticulture development, leaving trunk and regional roads improvement to their own sector programme because such major road improvement is out of the scope of this programme.

Rural Transport Improvement Programme is formulated from the viewpoint of horticulture development as shown in the following table. This programme assumes that the Ministry of Works and other related agencies implement other necessary improvement, besides components considered within the programme, on schedule.

Table 5.4.1 Components of Rural Transport Improvement Programme

Programme Component	Dealing Direction
Acceleration of Beneficiaries' Participation	To lighten beneficiaries' sense of road values and its usefulness, and accelerating their participation in maintenance through improving transport means. To promote beneficiaries' participation in maintenance by means of strengthening their capacity building.
Introduction of NGO and/or Donors' Cooperation on Rehabilitation Work	To fulfil rehabilitation work on schedule through objectively applying NGO and/or Donors' cooperation.
Appropriate Operation of District's Own Budget	To concentrate the limited inside budget into periodic maintenance routine work.

5.4.2 Promotion of Road Rehabilitation Work through External Supports

Even though the rural road improvement is the highest priority issue for rural development in the Region, the rural road improvement works are not sufficiently executed, as the works require a huge amount of budget. Local governments, who always confront shortage of budget, maintain the rural roads in collaboration with farmers, participating in the maintenance and offering their labour. However, farmers' participation is only a means to supplement the budget, and is not a fundamental solution. The rural road improvement in the Region should be promoted urgently, and the Regional Office should draw up concrete improvement plans involving external supporting organisations and

donors.

The overall rural road improvement plans are too big in scale for the horticultural development project to include the plans in the project, and it is beyond the limits of the entire project to solve the rural road improvement issue. Therefore, even though the rural road improvement is recognised as one of the most important issues for the horticultural development, this programme only recommends the local governments to promote the rural road improvement with assistance of the external supporting organisations and donors.

5.4.3 Promotion of Participation in Maintenance Work

The programme deals solely with district and feeder roads, and aims at improving road maintenance routines. Although the Tanzanian Government has intended to undertake the road maintenance through beneficiaries' participation, beneficiaries' involvement has been unsuccessful. The reasons for this are; lack of awareness of villagers on the importance of road maintenance, lack of awareness of beneficiaries on the usefulness of roads, difficulty in identifying beneficiaries of the roads, low progress in road maintenance system or beneficiaries organisation, and difficulty in procuring necessary equipment for road maintenance.

The Team considers that these are not brought about by lack of villagers' public or moral sense of responsibility, but by certain causes related to their rural life. The villagers' participation in the road maintenance is not sustainable unless the beneficiaries are motivated by a solid sense of benefit from the roads, or directly affected or inconvenienced by the ill conditions of the roads. As related to transport in the Study area, most villagers transport their produce on foot or by bicycle at the most, while a few in more urban areas utilises vehicles or motorcycles. Therefore, they do not regard roads to be useful because they do not benefit from them.

Roads are effectively utilised through not only the improvement of road facilities but also the improvement of transport means. The Team considers that the improvement of transport means is an important key factor for the Study area. Through such improvement, it is expected that beneficiaries' participation in road maintenance will be activated since villagers find roads useful. Therefore, it is proposed to introduce new cart/trolley to villages for the transport of horticultural produce and input.

The systematisation of road maintenance by villagers can be achieved by the farmers' organisations formed in the other programmes. The procurement of maintenance equipment is considered in line with the present administrative system for road maintenance, such as the Road Improvement Unit of the Ministry of Public Works.

5.5 Environment

5.5.1 Environmental Assessment

To prove whether the development will have significant impact to environment or not, a full-scale Environmental Impact Assessment (EIA) is needed. It was determined whether it was necessary to conduct EIA or not through Initial Environmental Examination (IEE). The measures to mitigate the impact identified through IEE were drawn up as well.

EIA is mandatory for a great number of projects that are likely to induce harmful effects on the environment. According to the NEMC's EIA criteria, a small-scale horticulture development project is classified as a project for which EIA is not mandatory, but IEE is to be carried out to assist in the decision making process either exempting the project from an assessment or determine whether EIA is required.

In view of the facts related above, IEE has been carried out based on the field works and the evaluation of the collected data and information. The assessment has been made following the "Report Requirements for Preliminary Assessment" defined by NEMC and using the JICA screening and scoping procedures and the category of environmental impacts as a reference. The improvements foreseen in this project are not expected to induce major harmful impacts on the environment as the implementation sites are already under farming and the expected scale of development is very small. Consequently, EIA is not required; instead some protective measures regarding these impacts are proposed.

5.5.2 Protective Measures for the Conservation of Environment

To establish and offer the integrated conservation measures for the farmers, a pilot farm should be operated in cooperation with other sectors involved at district and regional levels, especially those dealing with natural resources, water quality and health.

The measures of environmental conservation/protection referred to in the above are tentatively summarised in the table depicting the matrix of impacts on environment and relate mainly to both the natural and socio-economic environments, which include potential land degradation through erosion and vegetation loss, impacts related to the increase use of agrochemicals and a series of other issues that will be dealt with through the monitoring and mitigation measures proposed below.

(1) Natural Effects

1) Improvement of Vegetation and Ligneous Cover

The installation of windbreak should be encouraged especially around vegetable gardens to limit

soil erosion.

This activity can only be carried out through full involvement and participation of the communities on the one hand, and through the production of plants in village nurseries on the other. Consequently, some nursery specialists should be trained.

2) Improvement of Water Quality and Soil

(a) Water quality

Corrective measures related to the use of agrochemicals are closely dependant on the negative impacts occurring from the projected increased use of these products.

(i) Pesticides

Products of higher toxicity such as some organochlorine compounds and those with lesser toxicity as some organophosphorus compounds, which would exceed the norms prescribed by WHO or which are not properly registered under the Tropical Pesticide Research Institute (TPRI), should be traced in collaboration with TPRI and systematically controlled by the organisation managing the project. Farmers should first get an authorisation for the use of this pesticide. They should give the date, name and the dose. The application must be strictly controlled.

Some precautionary measures to be undertaken include:

- use of protective equipment
- minimisation of the losses by applying these chemicals when there is no wind and/or no rain (no risk of runoff and dispersion)
- minimisation of dispersion by washing the body and cleaning the spraying material at the site in an isolated pan.

(ii) Fertiliser

On poor soil, the effects caused by fertiliser would be positive and result in an increase of nutrients content of the soil. However, it is proposed to include in the plan some type of training on fertiliser application methods to avoid over dosage and potential discharge in water through runoff and contamination of groundwater.

(iii) River water

The type and quantity of pesticide used by farmers should be monitored. Pesticide constitutes a health risk for anybody working in the area of application as long as the products can be disseminated by water. The monitoring of pesticide application should be a common interest, and it is proposed that farmers' groups, with the help of the organisation managing the project, create a monitoring unit to which every farmer has to declare the quantities and types of pesticide he/she

has utilised and consult with it whenever it is deemed necessary to exceed the dose initially prescribed.

The population living in the area must be informed of the kind of risks incurred by pesticide particularly for the domestic use of water from ponds or rivers in order to mitigate these risks.
Data on concentration observed as a result of analysis carried out in the area must be made available to the farmers' groups and informed to the public.

Fertiliser application should be monitored in the same way as pesticide even though their toxicity is minor. Their negative effects include water eutrophication and proliferation of aquatic plants. Farmers should be trained in the correct use of fertiliser through good land preparation as well. The farmers groups should take charge of this training and sensitise individual members in the correct management of fertiliser use; this would consequently result in a substantial saving of them.

(iv) Underground water

Taking into consideration the small risks to contaminate underground water, the measures proposed above concerning river water would be largely enough to mitigate any risk of contaminating underground water.

(b) Soil

(i) Salinisation/alcalinisation

It is proposed to flush the paddy field plots when vegetables are about to be grown after rice at the end of the dry season to prevent salinisation/alcalinisation. This is of particular importance for Vertisols where the salt concentrations are relatively high. Flushing may be efficient, even though vegetables are presently cultivated without it every year after paddy.

(ii) Loss of soil fertility

The followings should be carried out to minimise loss of soil fertility.

- adequate application of fertiliser and manure
- organisation or improvement of the credit system for the acquisition of fertiliser
- introduction of manure collecting pits for better conservation of nitrogen and organic matter

(2) Socio-economic Effects

The planned horticulture development ultimately aims at improving the communities' living standards. These communities will participate only when they foresee their well-being.
Therefore, the measures to be taken along that line consist of:

① helping them to better manage their production farms through the provision of necessary

responsibilities for the purpose.

② making them accessible to the new production techniques and production means.

③ ensuring them the conditions for the diversification of their production in order to reach food as well as income security.

This supposes that farmers have to be well trained and be able to adequately manage the means of production by themselves. On an economic standpoint, options to reduce operation costs or economise the use of given input have to be closely examined. It means reducing the quantity of input to be used without reducing production, which can be done when the calendar and modality of application of these input, is scrupulously followed. This reduction has two advantages:

1. a positive impact on the natural environment;
2. a positive impact on the socio-economic environment.

(3) Measures Related to Health

1) Disease Prevention and Fight against Vectors

Disease prevention and fight against vectors can be realised through spraying chemicals. The organochlorine compounds that have been the main fighting tools against malaria are cheaper but have relatively high toxicity risk, making their use as domestic insecticide no more applicable. Some organophosphorus compounds such as Fenthion, Fenitrothion can be used as insecticide by pulverisation in anti- malaria campaign. They are less toxic for human beings and fishes. There are several other organophosphorus compounds presenting very low toxicity with a high LD_{50} value (quantity of product necessary to kill 50 per cent of a population under study) that can be used in the fight against malaria. Some other measures include:

- use of molluscicide plants: numerous plants present some molluscicide characteristics; their use can be considered.
- use of predators such as larva eating fishes
- drainage of permanent and semi permanent reservoirs
- deflection of vectors by setting housings away from shelters for domestic animals; mosquitoes will be taking their daily blood feeding from the animals (animal shelters established between villages and larva sites)

2) Extension and Sensitisation at Village Level

These are necessary namely concerning the mechanical prophylactic measures to take regarding the fight against vectors, the dangers of bathing in infected water of ponds or the preparation of re-hydration salts in case of diarrhoea.

3) Logistics for Health Centres and Dispensaries

Logistics need to be reinforced to allow the health institutions to adequately carry out the allocated tasks and prevent the spread of diseases. In addition, an adequate supply for medicine that cannot be easily out of stock should be ensured: anti-malaria tablets, injection materials, serum, anti-parasites, antibiotics, etc.

5.6 Action Plan

5.6.1 Implementation Schedule

The selective implementation of components of the programme is recommendable, because the available resources for horticulture and development strategy of each village or district shall determine the priority of components. Budgetary and human resources of district and capacity level of target farmers limit the scale of the implementation. Further, the implementation plan should be made in consideration of market capacity of horticultural crops.

From the village or sub-village side, the implementation guidelines shall be different depending on the horticultural zones. There are components that shall be applied to every district and every horticultural zone. On the other hand, there are components of which targets, levels and schedules shall be adjusted depending on the horticultural zones. For instance, Input Credit shall be introduced at once to the high input vegetable zone, but shall be introduced to the low input vegetable zone after the farmers reached at a certain level in agricultural technology by performing other projects. Concerning Improvement of Watering, means shall be varied depending on the scale of water source. Engine pumps shall be adopted to the farmland along the Ruvu River and treadle pumps shall be adopted where Kisima is used as water source. Additionally, the water harvest shall be applied to the fruit zone. Concerning Soil Management, means shall be varied depending on the plane land or slope land. Fertiliser application is applied to the plane land and soil conservation is applied to the slope land. Concerning Crop Diversification and District Seedling Farm, all their components shall be promoted at every area, but the priority crops shall be varied depending on the areas.

The following table gives the contents of the components by category of horticultural zonings, which were made taking into consideration the above-mentioned conditions.

Table 5.6.1 Contents of Components by Horticulture Zoning

Programme Components	Horticultural Zones		
	High Input Vegetable Zone	Low Input Vegetable Zone	Fruit Zone
Community Based Horticultural Development Programme			
Input Credit	Implementation of input credit	Gradual implementation of input credit	-
Watering	Improvement of Kisima, Improvement of watering method	Use of pumps	Use of water harvesting
Crop Protection	Proper chemical use	Proper chemical introduction Cultural method introduction	Proper chemical introduction Cultural method introduction
Quality Control of Produce	Implementation and achievement with other components		
Crop Diversification	Diversification of vegetables		
Soil Management	Proper fertiliser use	Proper fertiliser introduction	Soil & water conservation
Participatory Development Capacity Building Programme			
Training for District & Extension Officers	Strengthening of extension services		
Training for Group Leaders	Participation to trainings		
Community Awareness Creation	Participation to trainings, Community facilities		
District Seedling Farm Programme	Experimental plots	Experimental plots	Group seedling farms
Rural Transport Improvement Programme	Rural road rehabilitation, New transport means	Rural road rehabilitation, New transport means	New transport means

From the district side, the priority of the components shall be defined as shown in the next table. Generally, Kibaha and Bagamoyo districts put high priority on vegetable development, and Kisarawe and Mkuranga districts put high priority on fruit development. Rufiji district, which has disadvantage on horticulture geographically, shall take a long-term way to develop horticulture. Therefore, the priority order of implementing the components is low compared with other four districts.

Among Community Based Agricultural Development Programme, Input Credit and Improvement of Watering have high priority in the vegetable zone, as their needs are big. Soil Conservation has high priority in the fruit zone.

Concerning Participatory Development Capacity Building Programme, difference among the districts in priority order of implementing programmes is little.

Concerning District Seedling Farm Programme, Kibaha district has already Zegereni Farm as a district seedling farm. Other districts have low priority on the district seedling farm, as the district-operating farm is not always essential in the early stage, namely, the possible way of the implementation is selective implementation of parts of the programme. Group seedling farm is carried out in the fruit zone, and experimental plot is in the vegetable zone. Therefore, the priority order for them is made according to the actual situation.

Rural Transport Improvement Programme has ranked at low priority, as this programme shall be implemented in the long run.

The following table shows priority order of the programmes for each district assumed using the implementing guidelines.

Table 5.6.2 Priority of Programme by District

Programme Components	Bagamoyo	Kibaha	Kisarawe	Mkuranga	Rufiji
Community Based Horticultural Development Programme					
Input Credit	A	A	B	B	C
Watering	A	A	B	B	B
Crop Protection	A	A	B	B	B
Quality Control of Produce	B	B	B	B	B
Crop Diversification	A	A	A	A	A
Soil Management	B	B	A	A	B
Participatory Development Capacity Building Programme					
Training for District & Extension Officers	A	A	A	A	A
Training for Group Leaders	A	A	A	A	B
Community Awareness Creation	A	A	A	A	B
District Seedling Farm Programme					
District Seedling Farm	B	A	B	B	C
Group Seedling Farm	B	B	A	A	B
Experimental Plot	A	A	B	B	B
Rural Transport Improvement Programme	C	C	C	C	C

Remarks: "A" shows high priority, "B" shows middle priority, and "C" shows low priority, indicating relative priority in each district.

The specific implementation plan shall be prepared from both the site-specific implementation guidelines and priority of district government. The budgetary and human resources of district are also one factor of the implementation plan.

5.6.2 Cost Estimate

As the nature of the Master Programme that the concrete implementation schedule with the selected components depends on the districts and the target farmers, it is hard to estimate the whole programme costs. Therefore, only unit costs of each component are estimated based on the results of the Verification Study.

Table 5.6.3 Unit Cost of Each Programme

(Unit: TShs)

Programme Components	Unit Cost	Remarks
Community Based Horticultural Development Programme		
Input Credit	642,000	1 unit 10 loanees, additional TShs 3,120,000 is needed in case of providing VAEO with motorcycle
Watering		
Engine Pump	509,000	1 unit 5 farmers with a pump of dia. 2"
Treadle Pump	233,000	1 unit 1 farmer with a pump
Crop Protection	12,000	1unit 10 farmers with farm input
Quality Control of Produce	12,000	1unit 10 farmers with farm input
Crop Diversification	12,000	1unit 10 farmers with farm input
Soil Management	12,000	1 unit with 10 coconut seedlings
Participatory Development Capacity Building Programme		
Training for District and Extension Officers	3,786,000	1 unit 20 trainees with 8 days session and preparation of manual
Training for Group Leaders	1,436,000	1 unit group leaders from 8 unions
Community Awareness Creation		
Farmers' Training	4,211,000	1 unit 50 farmers with training at Morogoro
Group Activities by Multi-purpose Shed	8,111,000	Area 72m^2 (office and store room)
Group Activities by Milling Machines	5,927,000	Area 24m^2 (husking machine and milling machine)
District Seedling Farm Programme		
District Seedling Farm Total	63,554,000	
Construction Cost	(38,425,000)	4 ha farm (office, store room and nursery bed)
Tools	(4,000,000)	Farm tools
Equipment	(20,000,000)	1 pickup truck
Running Cost	(1,129,000)	Annual running cost
Group Nursery	12,000	1 unit 10 farmers with only scions
Vegetable Experimental Plots	12,000	1unit 10 farmers with farm input
Rural Transport Improvement Programme	6,000,000	1 km of gravel road with 3.5 m effective width

Programme costs shall be borne by the district agricultural section and beneficiaries, in case of no financial assistance obtained from outside. The annual budget of district agricultural section is less than TShs 10 million. Therefore, more effort is needed to obtain the programme budget. Application of financial support to international organisations, securing budget by including the projects in DADP, and so forth are considerable.

5.6.3 Implementing Organisation

The former sections explain the implementing organisation of each component. In this section, the overall organisational formation of the government side and community side is explained for the smooth and well-balanced implementation of the programme.

The entire frame of the organisations is planned as the following chart, which is similar to the organisations in the Verification Study. Farmers and farmers' groups shall implement each component at village or sub-village. The Community Project Management Unit (CPMU) shall be established to coordinate several groups or components in the community and government side. CPMU should be registered as a cooperative to keep accountability on its activity and accounting, depending on the scale of the programme. As every component in community is supported or guided by district officers or extension officers, the district government should establish the District Project Management

Committee (DPMC) to supervise the activities in the communities. Furthermore, the Joint DPMC should be established by districts to smooth and effective operation of the programme in coordination between the districts. The regional government should supervise all the organisations in the frame. In case that a donor or a NGO supports the programme, the Steering Committee should be formulated by DPMCs, regional government and relevant agencies of central government, as the highest decision-making organisation in the programme. The members of each organisation should be arranged as shown in the following chart.

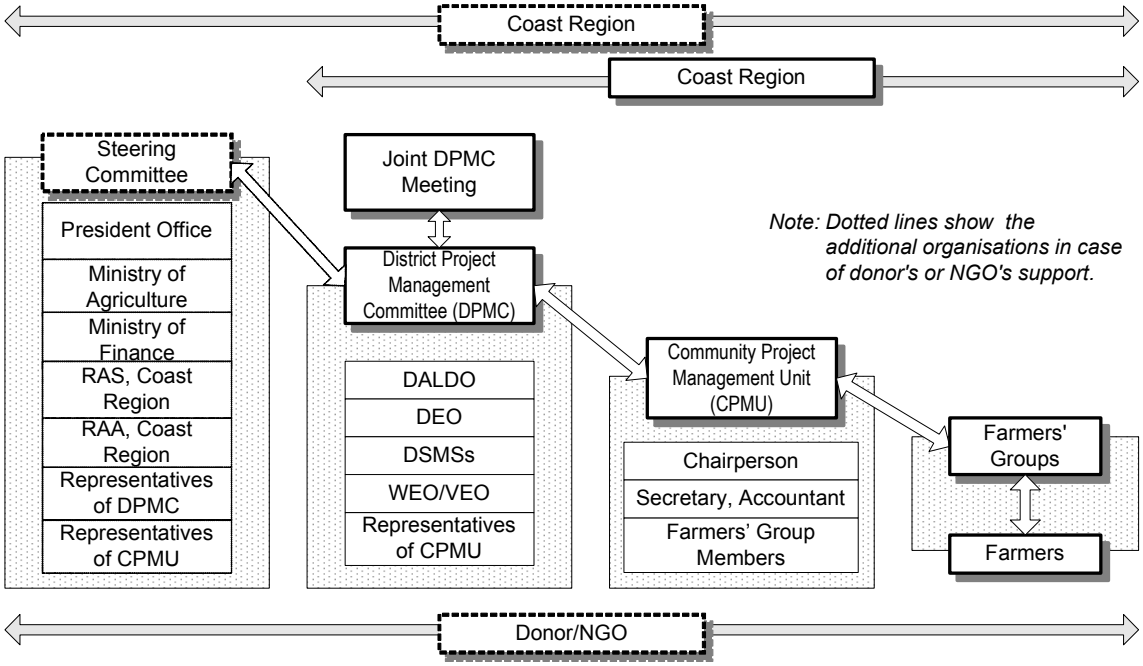

Fig. 5.6.1 Overall Implementing Organisation Plan

Interested farmers organise the farmers' groups, who are the minimum unit or beneficiary of the micro projects. The groups select group leader, secretary and accountant, and operate their activities in accordance with their own rule. The Community Project Management Unit (CPMU) is established to coordinate the implementation of the micro projects in village or sub-village. CPMUs should be separated from the village government system. CPMUs consist of the group members, and post a chairperson, a secretary and an accountant. The following chart gives the implementing organisation in village or sub-village.

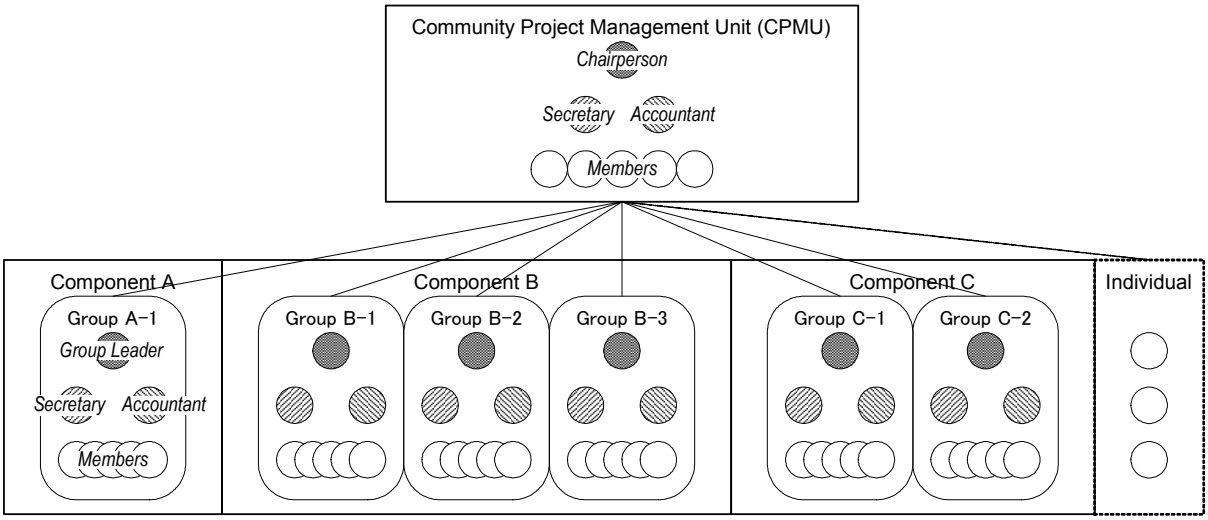

Fig. 5.6.2 Community Implementing Organisation Plan

Each organisation shall perform the monitoring the micro projects. The periodical meetings shall be held monthly for CPMU, bimonthly for DPMC, and semi-annually for Joint DPMC. In these meetings, the participants shall report their work plan, achievement and account each other, and they shall discuss their problems and solutions. It is very effective for motivating the participants that they come to know the situation of other groups, villages and districts and exchange their ideas. The minutes of the meetings shall be prepared and submitted to the upper organisation or the regional office, and then necessary instructions shall be made.

5.6.4 Implementing Procedure

The following shows the implementing procedure of villagers-leading projects

Villagers in a workshop analyse their needs of development and decide the priority of the projects. Extension officers who understand the participatory method facilitate the workshop. District office together with representatives of villagers shall take part in the decision making of the projects' priority referring "Table 5.5.2 Priority of Programme by District". Then they study the projects from the viewpoint of project cost referring "Table 5.5.3 Unit Cost of Each Programme". According to the above-mentioned study, villagers draw up an implementation plan while obtaining suitable advice of District.

Next, they must get a fund for project whose source agency may be District or donors. If there is an outlook of getting funds, they will decide the project. They form a group, draw up a regulation, decide the share of the cost and register the group if necessary. The group might be formed earlier even in the first workshop. The project can start after completion of the above procedure.

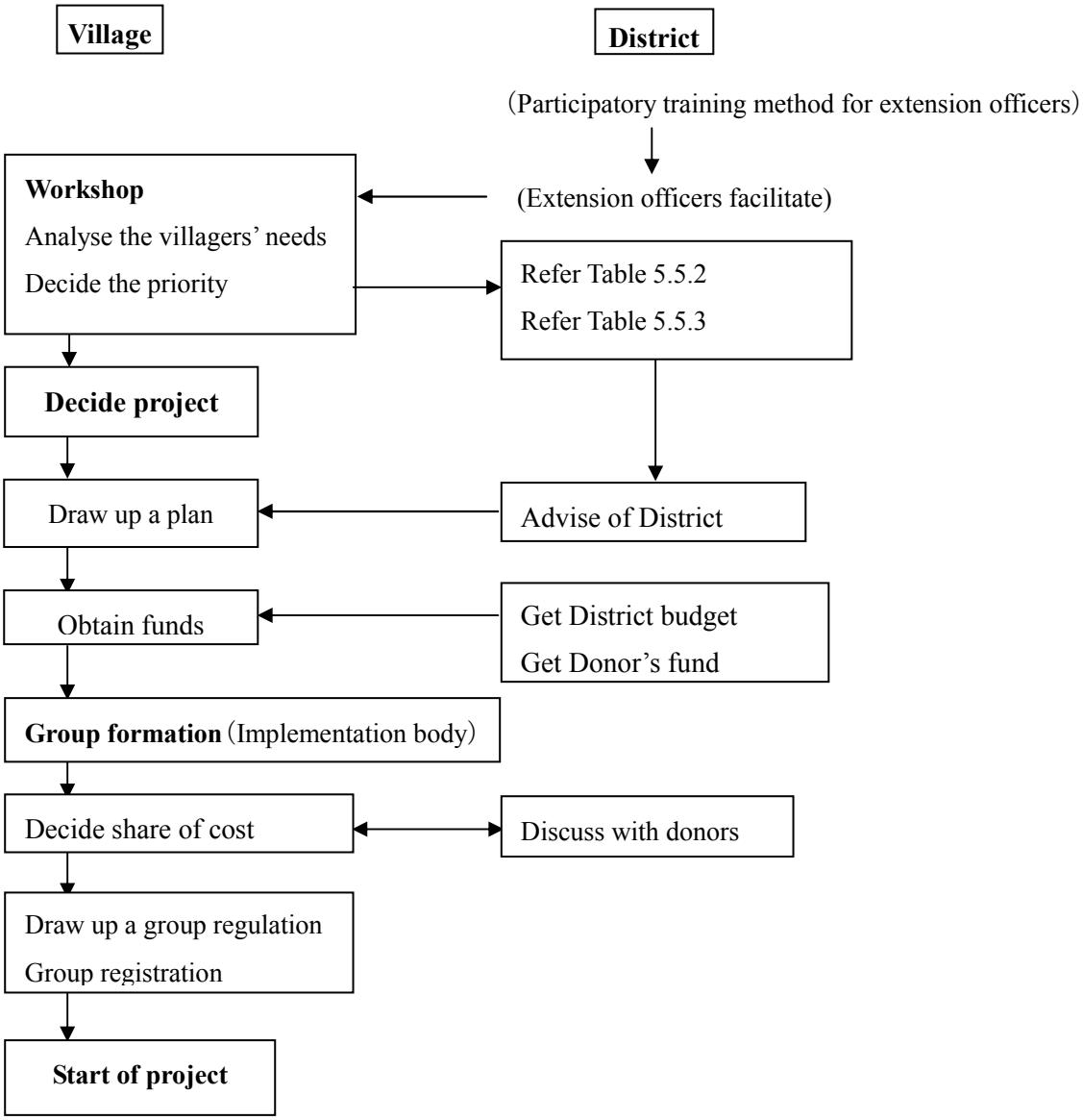

Fig. 5.6.3 Procedure of Implementation

Chapter 6 Conclusion and Recommendations

6.1 Conclusion

6.1.1 Effect of the Verification Study

The objective of the Verification Study is to verify the effectiveness and relevance of the Master Programme and the Action Plan, and the Team verified a main part of them in the Study. Subsequently, the Team analysed the result of the Study and has drown up the final Master Programme and Action Plan, which have high possibility to be implemented by amending them taking into consideration the result of the analysis.

During the implementation of the Verification Study, the Team also carried out technology transfer to the counterpart personnel of Coast Region and the Districts, and the people in the study area.
Through the implementation of micro projects, the farmers in the study area have been empowered to a certain extent. Not only each micro project but also several projects entangled have raised level of the villagers' activities, both in quality and quantity.

6.1.2 Feedback to the Original Master Programme

(1) Input Credit

The vegetable production has increased owing to the activities of this micro project; however, repayment rate of the credit was only 52%. Such low rates are attributed to such restrictions as climatic disaster, low awareness of loanees' repayment responsibility, implementation agency being government organisation, and so forth. If these restrictions are removed, micro project of Input Credit will be sustainable. To make Input Credit successful, implementation agency shall be CPMU. And then, the following conditions are essential for the credit managed by CPMU to come on the right truck; selection of loanees shall be well planned to identify honest and trustworthy farmers; amount of loan shall be adequate to loanees' repayment capacity; a certain amount of savings as mortgage shall be secured; and loanees shall have stable water sources.

(2) Improvement of Watering

Engine pump project has high possibility of its expansion, as the agriculture with year round water source is tolerant. The expansion shall be reinforced with such conditions as good coordination in a group, self-reliance without relying on outside assistance and good understanding of marketing principle. If farm input is combined to these conditions, the project will be more successful.

Treadle pumps are useful when farmers want to expand their farm far from water sources with a reservoir made between the source and the farm.

The Verification Study showed that it was possible to reduce interval of watering from every day to twice every three days. If this watering method expands in villages, farmers can acquire a lot, saving labour without putting any input, but they need more careful attention to observe the growing crops.

(3) Capacity Building for District and Extension Officers

The Team carried out an extension officers' training on horticultural technique and participatory development method for three years. Extension officers got good stimulation from the training, as they had rarely had this kind of training before. It was proved because their record of test, to measure the understanding of the training contents concerning the horticultural technology and the participatory development method, increased year by year. District officers have also empowered through teaching the extension officers and making the horticultural manuals. All the people concerned have been aware of the effect of this project and want it continued. Since the budget for this project is small, they must seek the way using their brains.

(4) Capacity Building for Community

Farmers' training of visiting advanced agricultural areas gave good stimulation to 250 farmers from five districts. They obtained new technologies, discussed each other during the training period and reported the result to other farmers after returning back to their villages. These activities have brought about village invigoration, and a new group was formed, a new kind of vegetables like paprika was introduced and a new farming technology like contour cultivation was practised. Extension officers also visited together and had good influence. Every District officer said that farmers' training should be continued even after the Verification Study, using the extension officers as instructors.

The Team put much energy into farmers' interchange of opinions. The Team took group members to other villages where the same type of project was carried out and gave them chances to discuss with one another. Zegereni Farm was also used as a training site. The training in the Farm shall be continued even after the Verification Study.

Group leaders' training was also focused on the interchange of opinions. During the training, the Team carried out an accountant course until every treasure that was handling cash understood accounting to a certain extent.

Multipurpose sheds and milling machine that villagers considered as big projects were used as tools of Capacity Building for Community. Villagers themselves planned, designed, constructed and managed these big projects. Moreover, they offered land, labour, sand and water for construction. The Team, on the other hand, supplied foreman to supervise the construction, equipment like mill machines and material like cement, timbers, and so forth. Villagers were empowered through these activities. If a need requires, expansion of the projects will be possible, as shown in the Mwanabwito that the villagers constructed a multi-purpose shed by themselves using wood and soil and a new mill outside

of the project was opened.

(5) District Seedling Farm

Zegereni Farm studied the possibility of cultivation of new kinds of vegetables that have seldom been cultivated in the study area and found the possibility to cultivate carrot, onion, garlic, sweet corn, paprika and water melon. Many people visited the Farm as a training site. However, even there is a management problem of the Farm, Kibaha District and Coast Region still want to maintain it. Therefore, the management shall be strengthened shifting the weight of the duties from the study to production business.

Objective of experimental plots project was to extend a cultivation method of horticulture implemented at Zegereni Farm to farmers and to carry out field tests that were conducted at Zegereni Farm. Farmers obtained knowledge of cultivation through this project, which gave them a big impact making their technical level higher. New vegetables that Zegereni Farm developed have been extended through the experimental plots.

Group nursery project in Mwanambaya and Mkuranga is already in the self-support level. It is because of the good coordination in the group and the good lead of the District Officers. This project is supposed to be continued even though there will be no assistance from outside donors.

6.1.3 Application to the Cooperation Studies of Agricultural Sector in Tanzania

The development studies in the agriculture sector carried out by JICA are the Support Program on Rural and Agricultural Sector Development, National Irrigation Master Plan and the Verification Study on the Small Scale Horticultural Development Project for Poverty Alleviation to Farmers in Coast Region. These three studies cover almost all the agricultural sectors from macro to micro portions in Tanzania. The Team verified the horticultural and micro portion of them in the Verification Study, which includes some universal issues. The result of the Study is expected to be reflected on the macro sector projects.

6.2 Recommendations

6.2.1 Implementation of Master Programme

(1) Important Notice in the Implementation Procedure

People's participatory projects are carried out by the villagers' intention. Therefore, the projects shall be implemented according to the villagers' pace without being hastened too much.

Districts should find the budget for succession of such administrative leading projects as extension officers' training, farmers' training and district seedling farm. Good balance between bottom up project and top down project contributes successful village development.

(2) Implementation System

CPMU shall be an implementation agency of many micro projects of Community Based Horticultural Development Programme and Participatory Development Capacity Building Programme. CPMU has strengthened the characteristic of agricultural cooperative and has increased its capacity in the Verification Study. However, generally speaking, it is still premature and there is large difference in ability among CPMUs. Further instruction by the administration is necessary.

Regional Office shall be a supervisory organisation and District Office shall be an implementation organisation under the decentralisation policy, however, there are some confusion in the roles of Region and District. As cooperation between Region and District is essential to carry out the Master Programme, both organisations should make effort to communicate to each other.

(3) Budget Preparation

The counterpart agencies have intention to continue most of the micro projects. Each District has put the projects into the District Agricultural Development Plan (DADP) and tries to obtain the budget. Some micro projects like the engine pump project and the milling machine project cannot begin without any initial funds, and there is need to find new budget source for the purpose. Project of farmers' training or alleviation of structural poverty can continue within the budget of District.

(4) Securing Extension Officers

Extension officers stand between a community and an administrative agency and have a role of reduction of structural poverty and to support farmers in each project. The administrative agency should give them sufficient condition to carry out these important jobs. The agency should prepare enough budgets for the extension works and simultaneously secure necessary number of officers.

(5) Monitoring and Evaluation

In case of implementation of the Master Programme, such monitoring and evaluation shall be carried out as was done in the Verification Study. Each organisation shall perform the monitoring of micro projects. Periodical meetings shall be held monthly for CPMU, bimonthly for DPMC, and semi-annually for Joint DPMC. In these meetings, the participants shall conduct participatory monitoring. The Joint DPMC shall be placed as evaluation meeting once a year, and the way forward shall be reviewed.

6.2.2 Marketing

There was not a component implemented, directly concerned marketing, in the Verification Study, but some components indirectly concerned marketing. They included issues of quality control of produce, crop diversification, adjustment of cropping time and introduction of early-ripening varieties. Flexible measures for marketing depending on the conditions should be considered through such activities.

6.2.3 Rural Transport Improvement Programme

"Rural Transport Improvement Programme" of the original Master Programme was not verified in the Verification Study as the Team had considered that this programme should have been formulated independently without waiting for the result of the Verification Study. Regional office is now preparing the formulation of a rural transport improvement project according to the original Master Programme. It is desirable that this programme would be materialised to complement the Master Programme.