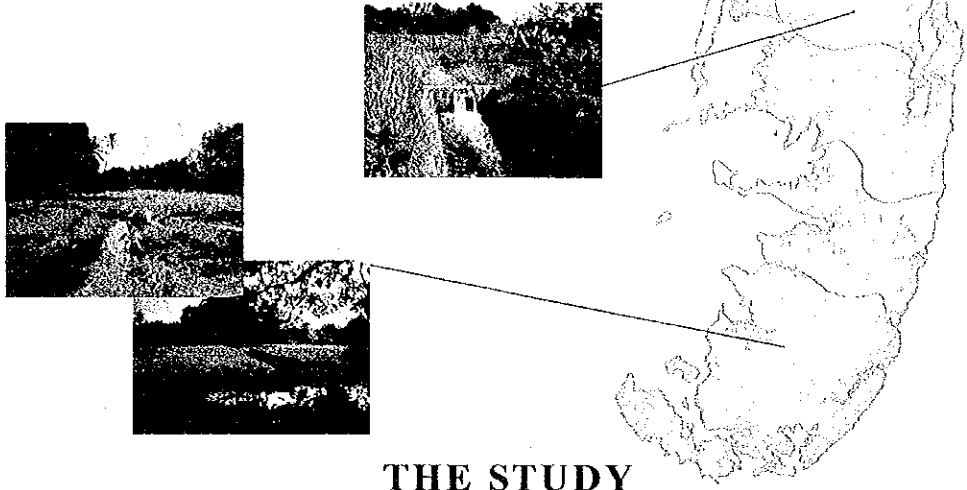


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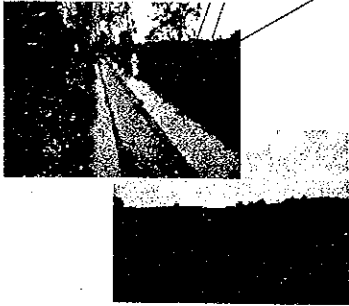
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THE STUDY ON THE ZANZIBAR IRRIGATION MASTER PLAN
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**MASTER PLAN
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NOVEMBER 2002

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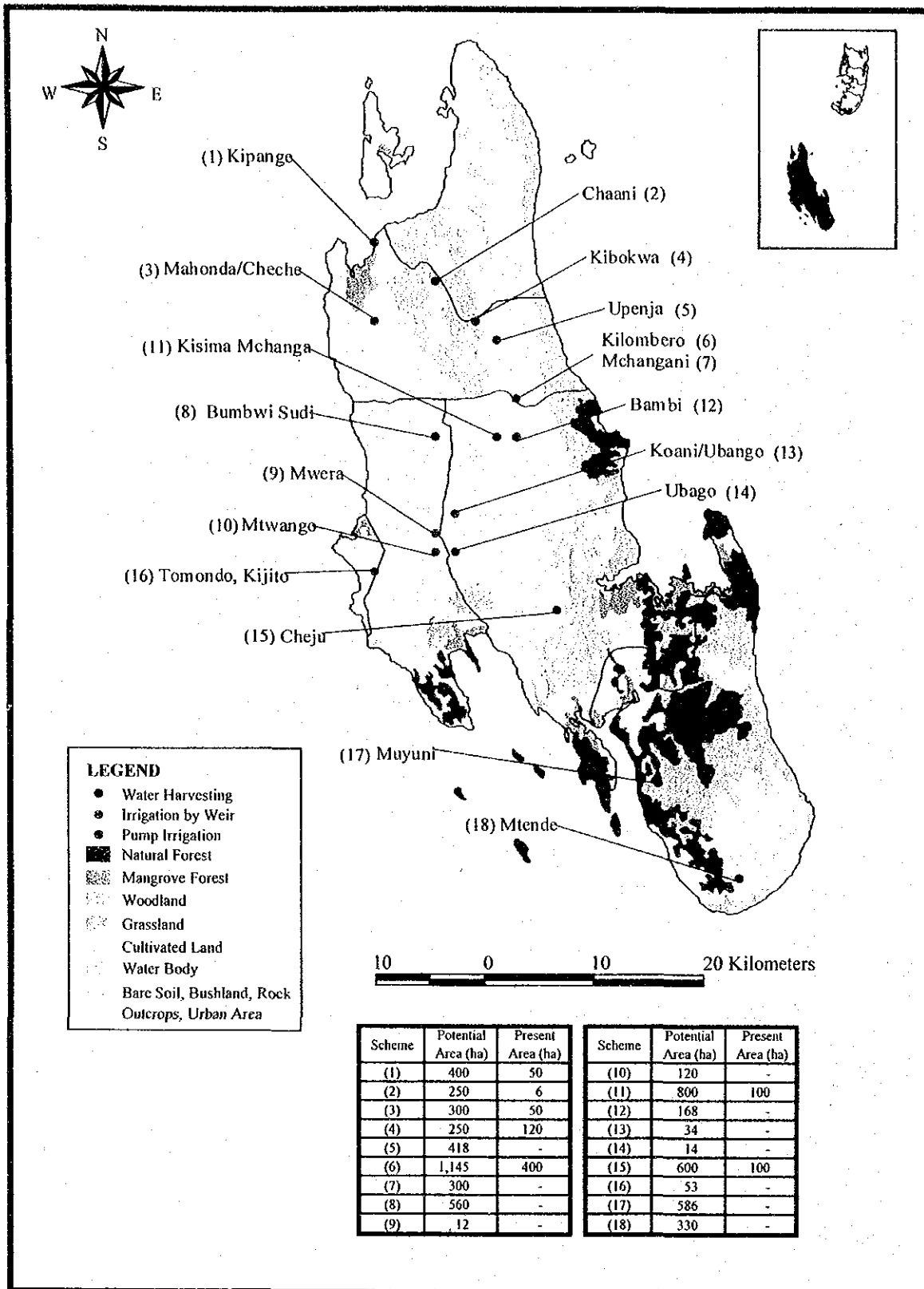
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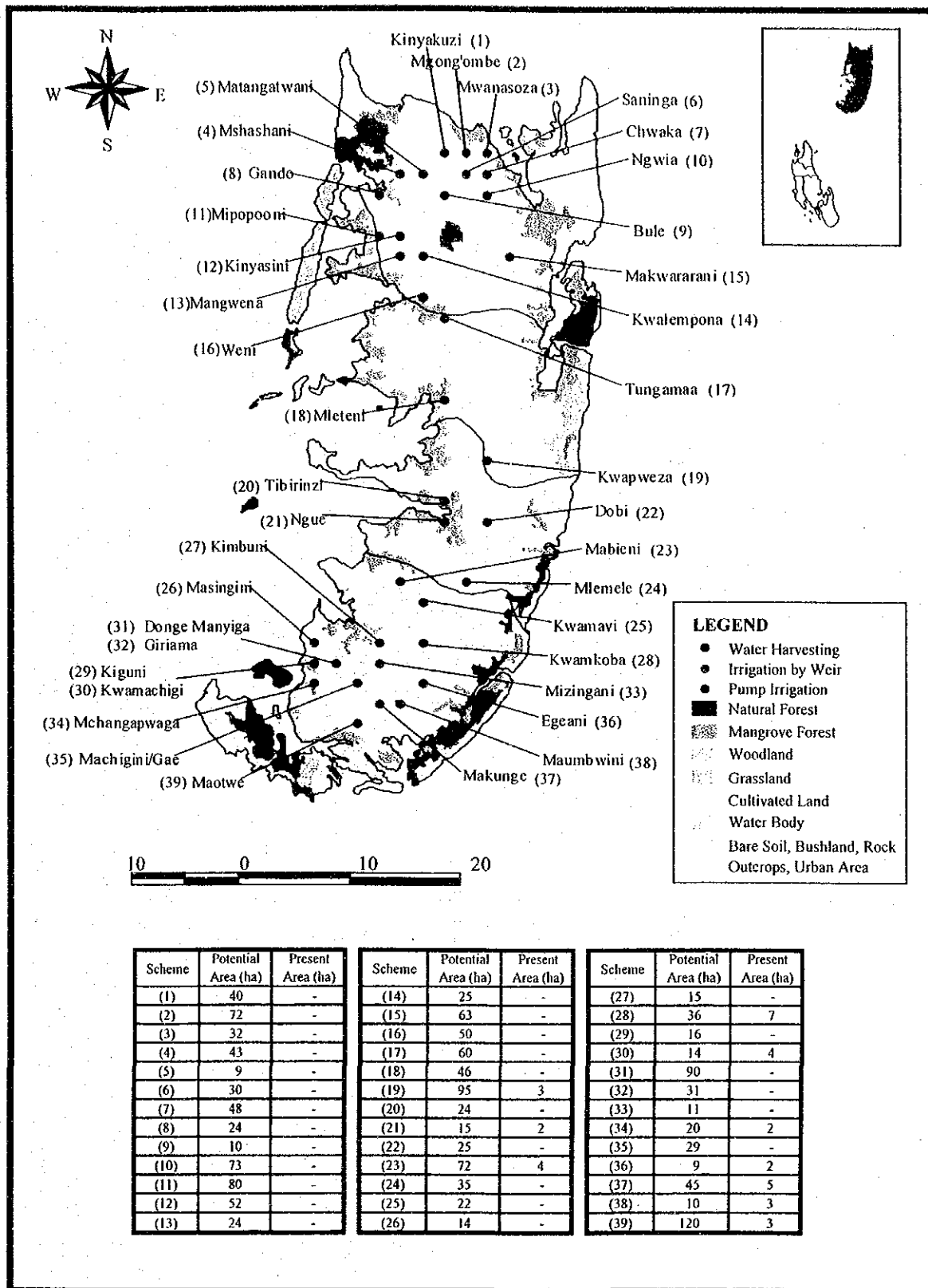
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Potential Irrigation Schemes in Unguja Island



Potential Irrigation Schemes in Pemba Island

ISLAND PROFILE

SOCIO-ECONOMIC BACKGROUND

Administrative Profile¹

Region	Area (km ²)	Administrative Units		
		District	Wards	Villages
North	459	2	22	31
South	409	2	27	41
Others	120	-	-	-
TOTAL	988	4	49	72

LAND USE

Land Cover ³	Area (1,000)		%
Forest	19,392	ha	17.4
Woodland	3,919	ha	3.5
Bushland	2,088	ha	1.9
Grassland	217	ha	0.2
Cultivated Land	78,263	ha	70.3
Open Land	7,051	ha	6.3
Water Features	206	ha	0.2
Others	266	ha	0.2
Total	111,402	ha	100.0

IRRIGATION

PRESENT CONDITION	North	South	Total
Water Harvesting			
Scheme Nos./Present Area (ha)	18/ 68	21/ 6	39/ 74
Potential Area (ha)	707	1,185	1,892
Irrigation by Weir			
Scheme Nos./Present Area (ha)	-/ -	-/ -	-/ -
Potential Area (ha)	-	-	-
Pump Irrigation			
Scheme Nos./Present Area (ha)	-/ -	-/ -	-/ -
Potential Area (ha)	-	-	-
Total			
Scheme Nos./Present Area (ha)	18/ 68	21/ 6	39/ 74
Potential Area (ha)	707	1,185	1,892

PEMBA

Population^{1,2}

Population (1988 Census)	267,039	persons
Population (2002 Projection)	375,000	persons*
Population (2020 Projection)	587,000	persons*
Population Density (2020 Proj.)	697.4	persons/km ²
Population Growth Rate	3.08	%
Nos of Farm Household (1990)	55,094	Nos

AGRICULTURE

Major Food Crops (2001)

Crop	Cultivated Area	Production	Unit Yield
Paddy	10,830 ha	12,996 ton	1.2 ton/ha
Cassava	10,042 ha	80,334 ton	8.0 ton/ha
Bananas	2,488 ha	24,875 ton	10.0 ton/ha
Yam	- ha	- ton	- ton/ha
S. Potato	4,013 ha	24,080 ton	6.0 ton/ha
Maize	251 ha	251 ton	1.0 ton/ha
Total	27,624 ha		

FUTURE PLAN

	North	South	Total
Group A			
Scheme Nos./Present Area (ha)	1/ 8	-/ -	1/ 8
Potential Area (ha)	40	-	40
Group B			
Scheme Nos./Present Area (ha)	5/ 22	3/ -	8/ 22
Potential Area (ha)	214	151	365
Group C			
Scheme Nos./Present Area (ha)	11/ 37	12/ -	23/ 37
Potential Area (ha)	429	902	1,331
Group D			
Scheme Nos./Present Area (ha)	1/ -	6/ 6	7/ 6
Potential Area (ha)	24	132	156
Total			
Scheme Nos./Present Area (ha)	18/ 68	21/ 6	39/ 74
Potential Area (ha)	707	1,185	1,892

ISLAND PROFILE

SOCIO-ECONOMIC BACKGROUND

Administrative Profile¹

Region	Area (km ²)	Administrative Units		
		District	Wards	Villages
Town/West	224	2	35	69
North	426	2	22	51
South	814	2	21	86
Others	202	-	-	-
TOTAL	1,666	6	78	176

LAND USE

Land Cover ³	Area (1,000)		%
Forest	22,768	ha	14.6
Woodland	34,022	ha	21.8
Bushland	30,843	ha	19.7
Grassland	3,115	ha	2.0
Cultivated Land	62,038	ha	39.7
Open Land	1,200	ha	0.8
Water Features	0	ha	0.0
Others	2,287	ha	1.5
Total	156,273	ha	100.0

IRRIGATION

PRESENT CONDITION	Town/West	North	South	Total
Water Harvesting				
Scheme Nos./Present Area (ha)	-/ -	4/ -	-/ -	4/ -
Potential Area (ha)	-	1,200	-	1,200
Irrigation by Weir				
Scheme Nos./Present Area (ha)	2/ 78	-/ -	3/ 12	5/ 90
Potential Area (ha)	173	-	332	505
Pump Irrigation				
Scheme Nos./Present Area (ha)	1/ 136	2/ -	6/ 42	9/ 178
Potential Area (ha)	560	1,268	2,180	4,924
Total				
Scheme Nos./Present Area (ha)	3/ 214	6/ -	9/ 54	18/ 268
Potential Area (ha)	733	2,468	3,428	6,629

UNGUJA

Population^{1,2}

Population (1988 Census)	375,539	persons
Population (2002 Projection)	608,000	persons*
Population (2020 Projection)	1,159,000	persons*
Population Density (2020 Proj.)	672.3	persons/km ²
Population Growth Rate	3.08	%
Nos of Farm Household (1990)	52,363	Nos

AGRICULTURE

Major Food Crops (2001)

Crop	Cultivated Area	Production	Unit Yield
Paddy	4,547 ha	5,456 ton	1.2 ton/ha
Cassava	6,013 ha	48,104 ton	8.0 ton/ha
Bananas	2,246 ha	22,455 ton	10.0 ton/ha
Yam	392 ha	3,916 ton	10.0 ton/ha
S. Potato	942 ha	5,651 ton	6.0 ton/ha
Maize	1,297 ha	1,297 ton	1.0 ton/ha
Total	15,437 ha		

FUTURE PLAN

	Town/West	North	South	Total
Group A				
Scheme Nos./Present Area (ha)	1/ 78	2/ -	-/ -	3/ 78
Potential Area (ha)	120	650	-	770
Group B				
Scheme Nos./Present Area (ha)	1/ 136	-/ -	2/ 12	3/ 148
Potential Area (ha)	560	-	312	872
Group C				
Scheme Nos./Present Area (ha)	1/ -	2/ -	3/ 42	6/ 42
Potential Area (ha)	53	550	1,386	1,989
Group D				
Scheme Nos./Present Area (ha)	-/ -	2/ -	4/ -	6/ -
Potential Area (ha)	-	1,268	1,730	2,998
Total				
Scheme Nos./Present Area (ha)	3/ 214	6/ -	9/ 54	18/ 268
Potential Area (ha)	733	2,468	3,428	6,629

1: Zanzibar Statistical Abstract 1997

2: National Land Use Plan Planning Policies, October 1994, Dept. of Statistics

3: National Reconnaissance Level Land use and Natural Resources Mapping Project, Final Report 1997

*: Population Data are rounded by JICA Study Team.

ABBREVIATIONS

ADB	African Development Bank
ASAREC	Association for Strengthening Agricultural Research in Eastern and Central Africa
ASP	Agricultural Sector Policy
BADEA	Arab Bank for Economic Development in Africa
BFI	Base Flow Index
BOT	Build-Operate-Transfer
BTO	Build-Transfer-Operate
CARE	Commission of Agriculture, Research and Extension
CBO	Community Based Organization
DARI	Division of Agriculture, Rice Cultivation and Inputs
DADO	District Agricultural Development Officer
DBO	Design-Build-Operate
EIRR	Economic Internal Rate of Return
EOJ	Embassy of Japan
ERP	Economic Recovery Programme
EU	European Union
FAO	Food and Agriculture Organization
FERP	First Economic Recovery Programme
FIRR	Financial Internal Rate of Return
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographical Information System
GOJ	Government of Japan
GOZ	Government of Zanzibar
GTZ	<i>German Agency for Technical Cooperation</i>
HBS	Household Baseline Survey
HDI	Human Development Indicators
HIPC	Highly Indebted Poor Countries
IA	Irrigators' Association
ICIPE	International Centre of Insect Physiology and Ecology
ICS	Irrigators' Cooperative Society
IDA	International Development Agency
IFAD	International Fund for Agricultural Development
IG	Irrigators' Group
ILO	International Labour Organization
IMF	International Monetary Fund
ITC	International Trade Centre
JICA	Japan International Cooperation Agency
JITAP	Joint Integrated Technical Assistance Programme
KATI	Kizimbani Agricultural Training Institute
LGA	Local Government Authority
MAFS	Ministry of Agriculture and Food Security
MALNR	Ministry of Agriculture, Livestock and Natural Resources

MANREC	Ministry of Agriculture, Natural Resources, Environment and Cooperatives
MDI	Multilateral Debt Fund
NGO	Non-Government Organization
NIMP	National Irrigation Master Plan
PDM	Project Design Matrix
PFI	Private Finance Initiative
PMI	Poverty Welfare Monitoring Indicators
PPP	Public Private Partnership
RADO	Regional Agricultural Development Officer
SERP	Second Economic Recovery Programme
SPFS	Special Programme for Food Security
SWA	Sector Wide Approach
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
VEO	Village Extension Officer
VEW	Village Extension Worker
WB	World Bank
WRMB	Water Resources Management Board
WTO	World Trade Organization
WUA	Water Users Association
WUCS	Water Users Cooperative Societies
WUG	Water Users Group
ZAPOCO	Zanzibar Poultry Company
ZARC	Zanzibar Agricultural Research Council
ZCCFSP	Zanzibar Cash Crops Farming System Project
ZIDP	Zanzibar Irrigation Development Programme/Plan
ZIDP	Zanzibar Irrigation Development Programme
ZIPA	Zanzibar Investment Promotion Agency
ZMC	Zanzibar Milling Corporation
ZPRP	Zanzibar Poverty Reduction Plan
ZSTC	Zanzibar State Trading Corporation
ZWRDP	Zanzibar Water Resources Development Project
ZSSP	Zanzibar Smallholder Support Project

MEASUREMENT UNITS

Extent

cm² = Square-centimeters (1.0 cm x 1.0 cm)

m² = Square-meters (1.0 m x 1.0 m)

km² = Square-kilometers (1.0 km x 1.0 km)

a = Are (100 m² or 0.01 ha.)

ha = Hectares (10,000 m²)

ac = Acres (4,046.8 m² or 0.40468 ha.)

Length

mm = Millimeters

cm = Centimeters (cm = 10 mm)

m = Meters (m = 100 cm)

km = Kilometers (km = 1,000 m)

Currency

US\$ = United State Dollars

US\$1.0 = J¥125 = Tanzanian Shillings 950
(as of August, 2002)

J¥ = Japanese Yen

Tsh = Tanzanian Shillings

Volume

cm³ = Cubic-centimeters

(1.0 cm x 1.0 cm x 1.0 cm
or 1.0 m-lit.)

m³ = Cubic-meters

(1.0 m x 1.0 m x 1.0 m
or 1.0 k-lit.)

lit 1 = Liter (1,000 cm³)

MCM = Million Cubic Meter

Weight

gr = Grams

kg = Kilograms (1,000 gr.)

ton = Metric ton (1,000 kg)

Time

sec = Seconds

min = Minutes (60 sec.)

hr = Hours (60 min.)

**THE STUDY
ON
THE ZANZIBAR IRRIGATION MASTER PLAN
IN
THE UNITED REPUBLIC OF TANZANIA**

MASTER PLAN

MAIN REPORT

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THE STUDY
ON
THE ZANZIBAR IRRIGATION MASTER PLAN
IN THE UNITED REPUBLIC OF TANZANIA

MASTER PLAN

MAIN REPORT

CHAPTER 1 INTRODUCTION

1.1 Authority

This Master Plan Report (the Report) has been prepared in accordance with the minutes of a meeting for the Study on the Zanzibar Irrigation Master Plan (the Study) agreed between the Ministry of Agriculture, Natural Resources, Environment and Cooperatives, Zanzibar, the United Republic of Tanzania (MANREC) and the Japan International Cooperation Agency (JICA) on May 9, 2002. The Report documents the results of the master plan study on irrigation development for Zanzibar executed during 4 months from May 11, 2002 to September 6, 2002.

1.2 Background and Objectives of Study

1.2.1 Background

Agriculture is the leading sector in the economy of Zanzibar. It contributed about 36% of GDP in 2000, and about 90% of the foreign exchange earnings. Zanzibar is comprised mainly of two islands; Unguja of 1,658 km² and Pemba of 985 km². The population in Zanzibar was estimated at 916,000 in 1999, of which about 60 % lived in Unguja and 40% in Pemba.

The food production of Zanzibar largely depends on smallholder farmers employing rainfed cultivation with low-level technology. Agriculture in Zanzibar is therefore weak, and suffers from low and unstable production. The arable lands of Zanzibar are estimated at 130,000 ha, of which 5,100 ha has been previously identified as potential area for irrigation. In order to improve such unstable and low production, the Government of Zanzibar (GOZ) proposed an irrigated agriculture development and prepared the Zanzibar Irrigation Development Programme in August 1997 (ZIDP), following the successful launch of the

National Irrigation Development Plan for the Mainland. The ZIDP concluded that the highest priority should be given to surface fed gravity smallholder irrigation schemes in Pemba. In Unguja, this method could be used for schemes with high value crops and a few areas where rice is irrigated under gravity.

On this basis, the GOZ commenced the irrigation development. However, because of slow progress with irrigation development, the need for consistency with the Agricultural Sector Policy issued in February 2000, and the requirement to contribute to food security, the GOZ requested the Japan International Cooperation Agency (JICA) through the Ministry of Agriculture and Food Security (MAFS), Mainland, to include Zanzibar in the study area of the National Irrigation Master Plan (NIMP) for the Mainland, which was being undertaken by JICA.

In reply to this request, JICA, with consent of the MAFS, agreed to include Zanzibar in the study area of NIMP. The minutes of the meeting in which agreement was made are shown in Attachment 1. The Scope of Work for the NIMP Study agreed between MAFS, Mainland and JICA on April 10, 2001 is shown in Attachment 2.

1.2.2 Objectives of the Study

The Study is to be executed in two phases, with objectives as follows:

Phase 1

- Formulate the Master Plan of Irrigation Development for Unguja and Pemba Islands with target year of 2020, by referring to the NIMP for the Mainland.

Phase 2

- Prepare the Action Plan for candidate irrigation schemes selected in the Master Plan.

During both phases, there will be a technology transfer for counterpart personnel through field inspection and report explanation in the course of field works.

The Report presents the results of Phase 1 activities only.

1.3 The Study Area

Phase 1

- Unguja and Pemba Islands.

Phase 2

- One or two irrigation scheme(s) for each of Unguja and Pemba Islands, which shall have been selected in the Master Plan Study.

1.4 Works Performed in Phase 1

The Phase 1 works executed during 4 months from May 11, 2002 to September 6, 2002, were as follows:

- Explanation of the Inception Report
- Collection and analysis of data
- Analysis on results of inventory survey for irrigation schemes to be rehabilitated and to be newly constructed
- Confirmation of irrigation potential areas
- Preparation of irrigation development level
- Formulation of Master Plan of irrigation development
- Selection of candidate schemes and subjects

1.5 Technology Transfer

The counterpart personnel assigned for the Study were as follows:

Counterpart Personnel Assigned

JICA Study Team	Position	Counterpart Personnel
Mr. H. Shimazaki	Team Leader/Development Policy	Mr. S. Abdulmalik*
Dr. S. Matsushima	Irrigation Drainage Plan/Water Management	Mr. S. M. Shaame
		Mr. M.A. Mchenga
Mr. H. Ohnuma	Farm Management	Mr. M.V. Pandu
		Mr. A.M. Omar
Dr. M. Osada	Institution/Organization/Management	Mr. J.A. Juma
Mr. E. Maeda	Macro-economy/Assistance Trend	Ms. A. Alawy
Mr. T. Igawa	Irrigation and Drainage Facilities	Mr. A.S. Mbinga
Mr. Y. Ogata	Agro-economy/Marketing	Ms. A. Alawy
Mr. T. Kuroda	Coordinator	Not Assigned

* : Chief Counterpart Personnel

Each member of the JICA Study Team has provided the counterpart personnel with technology transfer through the discussion in the data collection, field inspection and report explanation.

1.6 Steering Committee Meetings

The first Steering Committee meeting was held for the Inception Report 1 on May 15, 2002. The meeting was attended by staff of MANREC, the MAFS staff, Dr. J. Nozaka (JICA expert), and Eng. A.H. Simba. At the meeting, the contents of the Inception Report were agreed by these participants (Attachment 3).

The second Steering Committee meeting considered the Draft Master Plan Report on August 26, 2002. Attending were staff of MANREC, MLG, MFEA and MAFS. Also attending were Ms.K.Matsushita, the JICA Tanzania Office and Eng. A.H. Simba. The draft Report contents were agreed by the participants (Attachment 4).

The Report has been modified based on the comments raised in these Steering

Committee meetings.

1.7 Website for the Study

The progress of the Study has been published on a Website established by the MAFS, Mainland, aiming at sharing of data and information. The content would be updated from time to time. The website for the Study can be accessed using the following URL:

<http://www.kilimo.go.tz/projects/nimp/nimp.htm>

CHAPTER 2 PREVAILING GOVERNMENT POLICIES

2.1 General

In 1988 the government launched its first economic recovery programme (FERP), and in 1992 a second economic recovery programme (SERP), which transformed the economy progressively towards a reliance on market mechanism and private initiative, complementing the reforms of the union government. The union government, with the assistance of the IMF, began to introduce some structural adjustment but Zanzibar's economy was in a severe economic downturn, due mainly to the collapse of the export price of clove, which had contributed almost the whole of Zanzibar's export earnings.

Many bilateral donors did not provide aid to Zanzibar from 1995 to 2000, although multilateral donors such as the World Bank, ADB and the Gulf states continued to provide aid to minimize the macro level impact due to the lack of aid assistance from bilateral agencies.

2.2 Zanzibar Vision 2020

To publicize its commitment to eradicate absolute poverty in the country, the government prepared the Zanzibar Vision 2020 in January 2002 and concurrently launched the Zanzibar Poverty Reduction Plan (ZPRP) for implementation and operation.

The immediate economic policy of the government aims at boosting economic growth and breaking out of poverty trap in a setting of improved macro-economic stability. This follows the commitment of the government to withdraw from direct involvement in the production sector and allow for the private sector to be the principal agent of the economy. The budgetary mechanisms are aimed at facilitating the transformation of these ideas. The long-term development goal of the government is to build a strong, diversified, resilient and competitive economy, which can effectively cope with challenges of development, and confidently adapt to the changing market and technological conditions in the world economy.

With regard to the diversification and transformation of the economy, the Vision notes that "the process of the economy's diversification should be directed at the modernization of agriculture, tourism, fishing and the strengthening of industry, both internal and international trade sector." In particular, improvement of agricultural infrastructure and development of production for both export crop and food crop are should be considered a high priority. Measures for promotion of crop production adopted in the Vision are as follows:

- Encourage sustainable irrigation systems based on an integrated development approach, community participation, genuine demand by farmers and sustainable use of natural resources and the environment.
- Provide access to productive resources, opportunities and progress towards more socially just forms of agriculture for ensuring basic food security for the country by improving standards of nutrition, increasing output and quality of food commodity.

2.3 Zanzibar Poverty Reduction Plan (ZPRP)

To achieve the goals of the Vision, the government prepared the ZPRP in January 2002, not only as an implementing plan and strategies of Zanzibar Vision 2020, but also as its operational plan based on the utilization of the country's financial resources as well as provision of a climate to attract external resources. Specific achievements by 2020 envisaged in the ZPRP are as follows:

- Attain a high and sustainable economic growth. Expected average growth; 5 – 6% between 2000 and 2005; rising to 7 – 8% by 2010; and reaching to 9 – 10% by 2020.
- Realize a high level of employment in the modern sector: 50% in tourism and free zones; 20% in agriculture; and 30% in all other sectors.
- Attain a per capita income from current level of US\$ 200 per annum (US\$ 177 in 2000) to that of a middle-income country.
- Diversify the country's economy and migrate to a semi-industrialized environment with combined contribution of tourism, trade, manufacturing and construction to total GDP over 60%.
- Improve quality of life by raising life expectancy from 48 to 65 years.
- Improve and maintain high education standards and promote skill development cost effectively.
- Attain universal education by raising primary school enrollment from 84.2% in 1997 to 100% by 2005.
- Reach the 100% of transition rate to the second cycle of secondary education.

2.4 Agriculture Sector Policy (ASP)

The ASP was formulated in February 2000 by the MANREC with the assistance of FAO. In this new policy the role of the MANREC is confined to public support functions, policy implementation and management and promotion of an enabling environment for private sector production, trade and investment. Farmers, fisheries and entrepreneurs will carry out all commercial activities. As the government has decided to concentrate its efforts in the fight against poverty as articulated in the targets of ZPRP, the government needs to tackle challenges in

agriculture which will cause the greatest poverty reduction. Those challenges in agriculture are as follows:

- Low level of technology in use (hand hoe, low yield varieties).
- Unsupportive land tenure system.
- Insufficient access to key resources and services such as inputs, credit, and extension services.
- Limited market access for agricultural produce.
- Lack of capacity to process agricultural produce locally.
- Dependence on rainfed agriculture.
- Unsupportive rural infrastructure (feeder roads, ports, etc.)

In view of the prevailing policies and above constraints, the ZPRP put the highest priority on the following activities associated with the agricultural sector:

- Community based projects for both empowerment and meeting of community determined priorities;
- *Agriculture and natural resources projects which strengthen extension, provide improved planting material for pest and disease resistant food crops, develop workable credit schemes and improve involvement of farmers in development processes, and micro and small scale enterprises development schemes through appropriate NGO and private sector sources.*

In order to increase productivity in the agricultural sector (crops, livestock, fisheries and forestry), promotion of investment in rain harvesting structures and systems are mentioned in the ZPRP are specific actions required. Thus, development of agricultural investment programme is called for, and irrigation (or water management) is a priority component in the programme.

2.5 Zanzibar National Water Policy (ZNWP)

The government prepared the draft ZNWP in 1999. The objective of the ZNWP is to provide guidance on access to clean and safe water for all people and other water users to fulfill the needs of expanding social and economic activity. To achieve this objective, the following goals were set:

- Public ownership of resources to ensure that all Zanzibaris have access to this resource all the time;
- Protection of water resources and quality and use in accordance with conservation principles;
- Inter-sectoral linkages for coordinated resource development and management;
- Definition of the roles of different stakeholders including beneficiaries, donors, ministries and institutions;

- Development and provision of water supply and sanitation in a sustainable manner, with a demand responsive outlook; and
- Institutional development and local capacity building.

Taking into consideration these goals, the government elaborated the five issues including policies and strategies for future water resources management. Of these, the following are closely related to irrigation development:

Major Issues, Policies and Strategies Relevant to Irrigation Development

Issue	Policy	Strategy
(1) Ownership of water resources	Water is a basic resource which shall remain public all the time.	- Establishment of Water Resources Management Board (WRMB).
(2) Satisfaction of basic need for water	Priority in use of water resources is given to satisfaction of basic needs of the population.	- Water allocation by the WRMB. - Cross subsidy in tariff structure in favour of domestic category.
(3) Water funds	Self-financing by water institutions is applied.	- Collection of revenue from the consumers - Donor finance for transition period - Introduction of local loans - Government subsidies for transition period - Encouragement of community contribution - Execution of concession agreements
(4) Environmental protection	Development of water resources should not be harmful to environment.	- Setting regulations in respect of water against any pollution. - Setting up standards and technical procedures to be used in water abstraction - Systematic collection and compilation of data related to water issue. - Issuing of water rights and granting permits for water exploration and abstraction.
(5) Water as an economic and social good	Water should be always recognized as an economic good as well as social good.	- Promotion of economic growth, poverty alleviation and improvement of public health. - Appropriate water resource allocation based on maximization of benefits to community and fair share to users by integrated approach. - Water resources management in promotion of conservation and no negative environmental impact. - Participation and integration of various social and economic sectors. - Promotion of more commercial operational principles and increased autonomy to responsible institutions.

Source: the ZIDP

The draft ZNWP also sets the responsibilities for the relevant sectors. The responsibilities given to the MANREC on irrigation development are as follows:

- Develop water resources for irrigation.
- Control water use in all irrigation systems in accordance with the laid down water rights and regulations as provided by the WRMB.
- Provide statistics on water requirements for all agricultural activities.
- Raise awareness of farmers on proper use of land, proper care of sources of water, forestry, and their environmental protection.
- Promote use of surface water for irrigation activities.
- Encourage private participation in harvesting and storage of rainwater for agricultural purposes.

2.6 Environmental Policy

A comprehensive environmental study was conducted by the Zanzibar Integrated Lands and Environmental Management Project in 1990, and the results were compiled into a report titled *An Environmental Policy and Programme for Zanzibar*. The report was finalized in 1991, following modification of the policy and its adoption by the Zanzibar Revolutionary Council.

The report pointed out the need for preparation of an integrated land use plan to contribute to the protection of the environment by working out a well-balanced zoning of land and resources for appropriate uses. Emphasis was placed on the need to improve the management of rural lands, which is highly related to irrigation development. The report also indicated the need to control environmental factors on public health problems to reduce health risks related to irrigation and stagnant water. Furthermore, the report revealed the legislation of lands since Zanzibar has a complex land tenure system and land tenure had a profound influence on how people look after their lands. Security of tenure could encourage farmers to control soil erosion.

In order to maintain sound environment conditions, the report proposed the following activities:

- Maintain a well organized environmental information bank.
- Provide an environmental input into planning process based on a national environmental policy.
- Monitor the state of environment and organize research.
- Tackle immediate environmental problems and stimulate others to action for environmental protection.
- Promote awareness of, and training in, environmental issues.

The Environmental Management for Sustainable Development Act was prepared in 1996. The Act aims to

- (a) maintain basic ecological process of land, water and air

- (b) ensure the environmentally sound and healthy quality of life of the people of Zanzibar, present and future
- (c) promote the sustainable use of renewable natural resources
- (d) promote the rational use of nonrenewable natural resources
- (e) preserve the biological and cultural diversity of Zanzibar's lands and seas; and
- (f) strengthen the institutional capabilities for protecting the environment.

Of these, items (a) and (c) are closely related to irrigation and need to be considered in the planning and design of the irrigation development.

CHAPTER 3 SOCIO-ECONOMIC BACKGROUND

3.1 Current Economic Performance

Zanzibar administratively consists of 5 regions, 10 districts, 127 wards and 248 villages as of August 2002. The overall problem with the government economic management has been the sharp swing in the performance of the agricultural sector, which accounts for between 36.4 to 48.4% of GDP during 1990–2000, employs more than 60% of the population, especially in rural areas, and is dominated by clove production. GDP growth rate increased an average of 4.0% per annum during 1990–2000; and further moderate recovery is seen in its recent annual GDP growth rate; 4.5% in 1999 and 4.2% in 2000. But GDP growth did not result in any substantial change in per capita income both in Tsh and US\$ basis, as seen in the table below. Zanzibar needs a concerted effort to address its poverty problem. Inflation in Zanzibar fell sharper than on the Mainland during the period since 1998. The inflation rate has declined from 29.0% in 1995 to 6.5% at the end of 2000. This has been achieved largely through reduced domestic financing in pursuit of tight fiscal policy.

Major Economic Indicators

Description	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
GDP at constant (1985) prices (Tsh. mil)	3,315	3,854	4,881	5,010	5,240	6,759	7,241	7,540	7,578	7,917	8,607
Real GDP growth (%)	3.4	4.8	3.0	3.3	3.5	5.2	7.2	4.1	0.5	4.5	4.2
Per capita GDP at factor cost (thousand Tsh)	15	26	48	59	74	103	130	149	152	159	178
(US\$)	98	102	110	135	147	166	218	238	234	216	222
Consumer price change (% change, year on year)	40.7	26.3	20.0	23.2	222.9	29.0	18.7	12.7	8.0	5.5	6.5
Population (thousand)	680	700	722	744	765	787	811	835	861	887	916
Sectoral Contribution (%) to GDP											
Agriculture, Livestock & Natural Resources	48.4	48.1	42.9	43.2	37.9	40.9	40.4	39.7	36.9	38.1	36.4
Manufacturing	7.9	6.5	6.3	5.0	5.7	5.9	5.7	6.0	6.1	5.9	5.7
Water and Power	1.3	1.4	1.2	1.4	1.4	1.5	1.4	1.3	1.3	1.8	1.5
Construction & Quarrying	3.8	6.4	10.4	10.6	14.4	10.8	10.5	10.4	8.3	7.6	3.9
Trade & Tourism	25.0	24.6	25.9	27.3	30.2	19.8	20.7	19.8	20.0	21.0	20.0
Transport & Communication	1.4	1.8	2.5	2.8	3.4	3.9	5.3	5.3	5.1	5.5	6.0
Finance & Insurance	2.0	5.0	4.5	3.5	3.1	4.2	3.6	2.2	2.4	3.3	3.3
Public Administration & Others Services	15.2	15.0	15.3	17.1	17.3	18.5	18.5	20.9	24.4	21.9	23.0
Less: Bank Charges	-5.0	-1.8	-1.6	-2.2	-1.8	-1.6	-1.1	-0.4	-0.1	-1.2	-0.1

Source: Annual Plans 1990/91 – 2000/01 Ministry of Planning and Investment

3.2 Sectoral Economic Analysis

3.2.1 Overall Review

Although there is a diminishing trend over the years in the agricultural sector's contribution, it has retained a significant influence on the entire economy till now. For instance, in 1999 the agriculture sector grew at 7.0 %, particularly due to an increase in clove production, and GDP jumped from 0.5 % in 1998 to 4.5 % in 1999. The most positive aspect of the development of total GDP has been the sustained growth of other sectors, especially the non-clove sector, reflecting an increase of demand for trade goods, strong growth in the construction, tourism and service sectors. A table of GDP growth rates by sector is provided below:

GDP Annual Growth Rates by Sector

Sector	1995	1996	1997	1998	1999	2000
Agriculture	-1.0	13.1	-4.9	-4.5	7.0	-0.7
Mining and Quarrying	-4.9	0.5	0.5	-6.3	-1.7	29.3
Manufacturing and Handicraft	6.7	5.1	3.6	-0.9	2.1	4.0
Electricity and Water Supply	6.7	11.3	10.3	7.9	9.7	4.8
Construction	6.6	4.0	3.8	19.8	4.7	14.9
Wholesale & Retail Trade, Restaurants and Tourism	11.8	16.6	13.6	9.5	5.5	5.8
Transport and Communications	13.5	0.6	8.2	7.3	7.4	3.1
Finance and Insurance	31.1	5.9	31.9	10.5	36.9	2.8
Public Administration and Other Services	1.6	1.5	1.5	1.5	1.5	1.5
GDP (Factor Cost)	5.2	7.1	4.1	0.5	4.5	4.2

Source: ZPRP Background Paper Dept. of Statistics, Zanzibar

3.2.2 Agriculture Sector

The agriculture sector, comprised of crops, livestock, fisheries and forestry, is the leading sector of the economy of Zanzibar. It contributed 36% of GDP in 2000, employs about 60% of total labor force and provides 30% of total tax revenue. In rural areas, most families rely on agriculture and fishing activities for their livelihood. In Zanzibar, a rich variety of spices is grown, of which clove is the most important export crop, contributing to over 50% of foreign exchange earnings. Food crops cover about 60% of the total cultivated land, including cassava, rice, banana, sweet potatoes, legumes and maize. Production trend of food crops is given below.

Production of Main Food Crops – 1990/91 – 1999/00

(in tons)

Crop	1990/91	91/92	92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00
Cassava	179,352	175,826	149,122	168,340	141,128	133,940	126,948	96,768	112,624	122,846
Maize	1,392	1,235	645	812	1,093	522	229	551	286	591
Paddy	12,186	11,258	15,580	11,690	11,719	18,607	26,045	14,462	11,741	17,542
Banana/Pl	46,672	23,184	18,476	20,472	16,626	21,824	15,796	11,508	24,745	28,865
Sorghum	563	443	445	272	139	113	68	52	0	265
Sweet Potato	34,735	34,405	34,600	26,011	12,853	15,432	6,941	16,044	32,865	37,887
Yams	5,478	5,074	4,199	3,940	1,889	2,000	246	932	1,972	1,742
Tania	7,862	3,946	7,017	10,340	4,312	4,180	1,528	2,752	3,908	3,733
GG/Cow Peas	1,599	796	589	950	473	563	0	511	0	516
Pegeon Peas	261	206	133	208	97	125	90	132	28	34
Goundnuts	166	206	269	245	370	228	0	49	51	101
Total	290,266	256,579	231,075	243,280	190,699	197,534	177,891	143,761	188,220	214,122

Source: MALNR, Zanzibar; Zanzibar Report on the Implementation of the World Food Summit Plan of Action

3.2.3 Trade and Tourism

Since Investment and Liberalization Acts were endorsed in Zanzibar in the late 1980s, the trade and tourism sector has become increasingly an income-generating sector. The most recent reform measures are as follows:

- Establishment of Zanzibar Investment Promotion Agency (ZIPA) in 1991 to promote Zanzibar as an investment center. The ZIPA operates under Investment Act No. 2 of 1986.
- Initiation of selected Economic Zones for the production of goods for export under an Export Processing System since 1992;
- Initiation of a Free Port System of operation since 1998.

The sector provides basic commodities to the markets, and promotes the expansion of the economic activity of private sector. The sector boosted the number of tourists from 25,000 in 1991 to almost 95,000 in 2000.

3.3 Sector Economic Analysis

3.3.1 Fiscal Balance and Deficit Financing

Fiscal performance of the GOZ was until recently very weak, but in the past three years tight government expenditure control under the cash budget system has minimized the deficit. After subvention from the Union Government, the fiscal balance showed a surplus in 1999/00 and 2000/01, but Zanzibar's revenue collection is still insufficient to meet its expenditure needs.

Development expenditure, which suddenly dropped to 6.4 % of total expenditure in 1995/96 from 45.8 % in the previous year, is only a fraction of total expenditure since 1996/97. The reason for this sudden decrease is not mentioned in the ZPRP, but the general economic decline in Zanzibar seemingly caused this down turn and neglect of development expenditure. Another reason may be the impact of the "aid-boycott" by many bilateral agencies from 1995 to 2000. The government increased its amount by 71 % to Tsh. 1.0 billion in 2000/01 from the previous year's Tsh. 0.6 billion. Although its share is still low (2.4 % of total expenditure), this increase is considered to reflect the government's commitment to the growth and poverty reduction.

Government Finance

(unit: million Tsh.)

Items	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01
Total Revenue	13,618	19,146	19,808	37,286	37,691	71,596	43,848
of which, Import taxes	9,804	14,965	12,431	22,733	22,687	37,425	20,609
Total Expenditure	27,268	13,893	19,833	38,394	34,710	63,064	43,139
Recurrent	14,767	13,004	19,073	37,759	34,221	62,466	42,112
(% of total expenditure)	(54.2%)	(93.6%)	(96.2%)	(98.3%)	(98.6%)	(99.1%)	(97.6%)
Development	12,501	889	760	635	360	599	1,027
(% of total expenditure)	(45.8%)	(6.4%)	(3.8%)	(1.7%)	(1.4%)	(0.9%)	(2.4%)
Balance before Grants	-14,166	5,173	-25	-1,108	2,981	-437	-4,466
Grants	516	80	0	0	0	8,968	5,175
Cash Adjustments	-1,312	-29,937	-8,076	8,104	-609	n.a.	n.a.
Overall Balance	-14,962	-24,684	-8,101	6,996	-1,123	8,531	709
Financing (net)							
Foreign	3,753	968	0	0	0	0	0
Domestic	11,209	23,716	8,101	-6,996	1,123	-8,531	-709

Source: EIU Country Profile 2001; for 1998/99 – 2000/01 ZPRP Background Paper

3.3.2 Sectoral Budget Allocation

The table below shows the composition of the budget by sector. Expenditure allocation to the agriculture sector has remained relatively stable but low, at only 5.2 % of the recurrent budget in 2001/02. The ZPRP suggests that more resource allocation to agriculture sector should be considered, particularly extension (including irrigation) and research services.

Percentage of Sectoral Budget

(unit: %)

Sector	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02
Administration	9.7	13.0	10.2	10.7	12.6	11.8
Finance and Economy	45.3	24.9	42.7	32.2	32.2	30.8
Education	13.1	18.5	12.4	12.8	15.9	13.9
Health and Social Welfare	8.5	12.3	8.5	9.4	8.3	10.3
Agriculture	5.3	6.6	5.2	4.8	6.0	5.2
Justice	7.2	11.4	9.2	11.0	11.0	10.2
Infrastructure	4.8	6.8	4.8	5.7	5.7	7.0
Others	6.1	6.5	6.4	9.8	10.3	10.7

Source: The ZPRP

3.3.3 Trade Balance

The Trade balance has been worsening due to sharp increase in imports compared with exports. Since 2000/01 both imports and exports have decreased due partly to low levels of economic activities. While the decline in imports is also partly explained by the government's enforcement of tax collection, the decline in export is partly explained by the decrease of traditional exports on account of a decrease in volume and unit price of clove. According to the Bank of Tanzania's annual report, the fall in clove exports is largely explained by cyclical factors, but low prices offered to farmers is also a factor of the fall, which led to the smuggling of clove to neighboring countries.

Trade Balance

(unit: US\$ million)

Year	Export	Import	Trade Balance
1995/96	4.38	60.58	-56.2
1996/97	6.08	65.79	-59.71
1997/98	7.49	81.64	-74.16
1998/99	3.97	101.89	-97.92
1999/00	35.7	104.0	-68.3
2000/01	6.3	69.9	-63.6
2001/02	16.1	68.1	-51.91

Source: The ZPRP Background Paper; for 1999/00 and 2000/01 Bank of Tanzania's Annual Report 2000/01

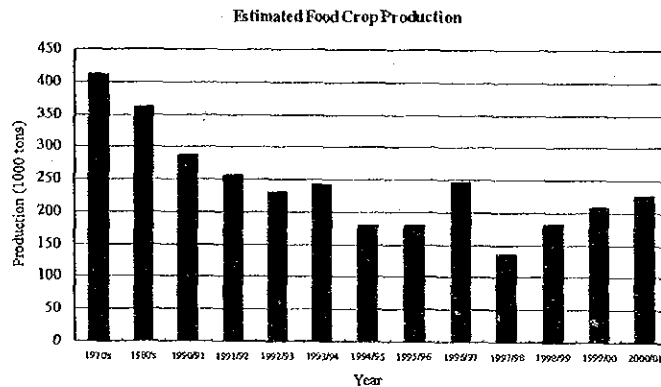
3.4 Social Issues

3.4.1 Food Deficit

Zanzibar was traditionally able to import sufficient food when there were shortages in domestic production. However, this situation changed because of declining foreign earnings and associated increasing prices of import commodities, population growth and increasing decline in agricultural productivity. The food

crop production has been declining from 60% of its contribution to food supply in 1970 to 42% in 1980 and to less than 35% in the 1990's, mainly due to decrease of farm land by population pressure.

The figure to the right shows the production of food crops in Zanzibar from the 1970's to 2000/01.



Source: Food Self-sufficiency in Zanzibar 1996, Status of Irrigation Development in Zanzibar-2001, Statistic Bureau of Zanzibar

The production figures include rice, cassava, maize, sorghum, millet, bananas, sweet potatoes, yams, and pulses. The steady decline in domestic food crop production over the past 20 years is apparent from above table.

Rice, wheat flour and sugar are the major imported food of Zanzibar and the table below shows that the total imports of these commodities fluctuated around 40,000 to 70,000 tons per year from late 1980's to 1994 except 1989 and 1990. Food trade of Zanzibar is liberalized, with Zanzibar importing about one-quarter of its staple food supply from 1991, unlike the Mainland in which a much higher degree of self-sufficiency is apparent.

Total Import of Major Foods

(Unit: ton)

Year	Rice	Wheat	Sugar	Re-export	Total
1984	33,300	6,000	3,000	-	42,300
1985	36,700	12,000	11,500	-	60,200
1986	40,000	12,000	8,000	-	60,000
1987	29,400	12,300	6,000	-	47,700
1988	26,000	15,000	12,200	-	53,200
1989	15,000	3,950	5,772	-	24,722
1990	5,995	1,436	3,030	-	10,461
1991	33,425	14,530	13,400	-	61,355
1992	44,515	5,423	1,545	-	51,483
1993	37,129	23,031	10,560	8,999	61,721
1994	59,748	16,625	15,545	17,514	74,404

Source: *Food Self Sufficiency in Zanzibar, 1996*

Rice is a major staple food crop in Zanzibar and changes in total rice supply (both domestic production and imports) are shown in the table below. Domestic production has fluctuated over the ten year period, with no significant increase in rice production having been achieved. According to the Agricultural Sector Review of Zanzibar published in June 1999, 15,600 ton of rice is produced and 80,000 ton of rice is imported yearly to meet the deficit. Thus, the self-sufficiency rate for rice is less than 20% in recent years.

Supply of Rice in Zanzibar

Year	Production (ton)	Import (ton)	Consumption (ton)	Dependency Ratio (%)
1984/85	13,122	33,300	46,422	0.28
1985/86	10,162	36,700	46,862	0.22
1986/87	5,273	40,000	45,273	0.12
1987/88	13,234	29,400	42,634	0.31
1988/89	13,371	28,000	39,371	0.34
1989/90	11,623	20,200	31,823	0.37
1990/91	7,921	18,678	26,599	0.30
1991/92	73,18	33,425	40,743	0.18
1992/93	10,127	44,515	54,642	0.19
1993/94	7,598	32,900	40,498	0.21
1994/95	8,800	52,078	60,878	0.14

Source: *Food Self Sufficiency in Zanzibar, 1996, Status of Irrigation Development in Zanzibar, 2001*

Children in Zanzibar are more likely to be underweight and suffer from wasting compared to children in the Mainland as shown in the below table. Another report (MALNR FAO 1999) indicates that approximately 50% of Zanzibar children under 5 years old suffer from malnutrition and 20% of children in the rural areas are severely malnourished.

Malnutrition Status of Children

Region	Moderate Stunting (%)	Moderate Wasting (%)	Moderate Underweight (%)
Mainland	43.6	7.1	30.5
Total Urban	32.9	7.6	19.5
Total Rural	45.9	7.0	32.9
Zanzibar	37.1	11.0	33.8

Source: *Bureau of Statistic (Tanzania) and Marco International Inc. (1997)*

3.4.2 Poverty Status

The poor in Zanzibar constitutes 51% of the population with 36% living in absolute poverty. Most of the poor are located in the rural areas, and engaged in agriculture. According to the ZPRP, the highest income per capita level is in Unguja West, and the lowest in North B also in Unguja, which is closely followed by Micheweni in Pemba. In general, Pemba is worse off than Unguja as illustrated in the table below.

Average Income by District – 1991 (Index average = 100)

Unguja						Pemba			
North A	North B	Central	South	West	Zanzibar Town	West	Micheweni	Chake	Mkoani
87	61	112	88	142	126	88	64	138	95

Source: The ZPRP

Dependence on agriculture is higher in Pemba with nearly 60% of household having fields compared to just over 30% in Unguja. Pemba is also worse off than Unguja in terms of possession of durable goods.

Other indices of poverty including human capability, mortality, nutrition, access to basic social services like water and sanitation show clear signs of moderate to severe poverty in certain districts.

3.4.3 Gender Issues

In Zanzibar, women represent 51% of the population and contribute to 70% of the agricultural labor in food crop production¹. Nevertheless, only 20% of women own land. In addition, women are generally excluded from access to credit, information and extension services and appropriate farming technology. These hamper women's efforts to increase productivity. Such situations have been unchanged due to a lack of social efforts to uplift women.

Women are given less chance to participate on water users' committees, which could lead to a possible disadvantage in the even distribution of water from irrigation schemes.

The ASP has issued the following policy statements on improving the women's condition:

- Introduce and enforce gender sensitive policy, programs, and projects in all matters related to agricultural development including irrigation development.
- Re-orient extension and other support services to adequately address needs according to gender.
- Ensure both men and women have access to credit for agricultural development.

¹ United Nations Common Country Assessment for Zanzibar, July 2001.