

MINISTRY OF WATER AND IRRIGATION
THE UNITED REPUBLIC TANZANIA

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR RURAL WATER SUPPLY IN
MWANZA AND MARA REGION
IN
THE UNITED REPUBLIC OF TANZANIA**

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NOVEMBER 2008

JAPAN INTERNATIONAL COOPERATION AGENCY

KOKUSAI KOGYO CO., LTD.

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Preface

In response to a request from the Government of the United Republic of Tanzania, the Government of Japan decided to conduct a basic design study on the Project for Rural Water Supply in Mwanza and Mara Region in the United Republic of Tanzania and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Tanzania a study team from November 28, 2007 to February 1, 2008 and from March 9, 2008 to March 18, 2008.

The team held discussions with the officials concerned of the Government of Tanzania, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Tanzania in order to discuss a draft basic design, and as this result, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the United Republic of Tanzania for the close cooperation extended to the teams.

November 2008

Masafumi KUROKI

Vice President

Japan International Cooperation Agency

November 2008

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Rural Water Supply in Mwanza and Mara Region in the United Republic of Tanzania.

This study was conducted by Kokusai Kogyo Co., Ltd., under contract to JICA, during the period from November 2007 to October 2008. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Tanzania and formulated the most appropriate basic design for the project under Japan's Grant Aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Hiroshi FUJITA
Project manager,
Basic design study team on
The Project for Rural Water Supply in
Mwanza and Mara Region
Kokusai Kogyo Co., Ltd.

Summary

1. Background of the Project

The United Republic of Tanzania (hereinafter referred to as "Tanzania") is located in the eastern part of Africa. It covers an area of 884,000 km² and has a population of 39.5 million. The target area includes the Mwanza and Mara regions which face Lake Victoria and enjoy a favourable economic environment with an excellent fishery harbor, ample rainfall and land suitable for agriculture.

Traditional hand dug and shallow wells make up 70% of water supply facilities in the Mwanza and Mara regions in this project. Most of the piped water supply facilities were constructed in 1970's or earlier and have deteriorated, especially facilities which use lake water, to the point that 63% of the facilities are unable to supply water. Furthermore, considering the increasing population, it is not possible to keep pace with development and maintenance of the facilities. This leaves a large number of people unable to obtain safe water easily and leads to the spread of waterborne disease and problems for women and children left with the burden of travelling long distances to fetch water. The water supply rate is 51% (2005) in the Mwanza region and 45% (2005) in the Mara region; far from the 52% nationwide average in Tanzania. This potentially could result in a situation in which one out of two persons is left without safe water, and therefore urgently requires improvement of the water supply facilities in the target area.

In order to improve this situation, the government of Tanzania has set a target for people to be able to obtain safe water within 400m of their residence by 2025. This project will contribute to raise the current water supply ratio in the target area.

2. Result of the Study and Contents of the Project

(1) Summary of Result of the Basic Design Study

The based on the above background, Japan International Cooperation Agency (JICA) decide to send basic design study team to Tanzania form November 28, 2008 to February 1, 2008 and from March 9, 2008 to March 18, 2008. The team conducted natural condition survey (field survey, water quality analysis, geophysical prospecting and trial boring) and social condition survey (hearing at target village and investigation of implementing agency ability).

The summary of result for the field survey and study in Japan are as below.

- i) Procurement of equipment

All of the well facility will be constructed by Japan side and there is no adequate governmental agency for Tanzania side which to be provided the equipments for boring, therefore procurement of equipment shall eliminate from this project.

ii) Public faucet scheme

There are eight (8) public faucet schemes were requested, four (4) schemes are utilizing Lake Victoria water and four (4) schemes are utilizing ground water. Trial borehole testing was conducted in eight (8) locations which requested public faucet scheme utilizing ground water. As a result of analysis, water yield and water quality of the testing boreholes and the existing boreholes were not comply with project requirements, therefore four (4) schemes were eliminated from public faucet scheme. And four (4) schemes which utilizing Lake Victoria water were eliminated from public faucet scheme. Three (3) schemes of four were eliminated based on the social survey "payable amount" is not comply with requirement and another one (1) scheme was eliminated based on the social survey "capability of the operation and maintenance"

Based on the above results, requested all of the eight (8) (for 10 villages) public faucet schemes were eliminated and hand pump well schemes were planned in those 10 villages.

iii) Hand pump well scheme

Hand pump well scheme was studied for originally requested 289 locations and 41 locations which eliminated from public faucet scheme. As a result of the field survey, 77 locations were eliminated because of that 1) construction machineries are unable to access borehole location and 2) borehole location is located very far from villager's residence, 6 locations eliminated by the analysis of water quality and 57 locations were eliminated by geophysical prospecting. Total 140 locations were eliminated from this project. In addition, 13 boreholes which expected successful rate is below 30% were eliminated from the project, because they are concluded that cost versus effect is low.

In addition to 177 locations which selected above process, five (5) testing boreholes that were constructed in the development study "the development study for the rural water supply in the Mwanza and Mara region" and confirmed with project requirement were included in this project. Platforms will be constructed and hand pumps will be installed at the five (5) locations. Thus total number of the hand pump well schemes became 182.

iv) Spring protection

Construction of the spring protection had not been included in the requests, however, it was one of the priority project (BUSAWE and KASOTA villages) which recommended in the development study. The team discussed with implementing agency and agreed to include two (2) spring protection schemes in

this study. As a result of the field survey, a spring protection facility was already constructed in BUSAWE village, therefore it was eliminated from the project and a spring protection in the KASOTA village shall include in this project.

(2) Contents and Scale of the Project

A. Facility Construction

A detailed list of facilities which will be constructed in this project is given below.

Table 1: Facilities planned for this project

Description	Total	Contents
Target Village	44 villages	26 villages in Mwanza region and 18 villages in Mara region
Borehole Construction	177 locations	Including installation of casing and screen
Platform Construction	182 locations	Concrete platform, 3.0m of drainage
Installation of Hand pump	182 locations	Including maintenance tools and one set of spare parts
Construction of Spring Protection	1 location	Distribution pipe, intake pipe, water tap and 2 reservoir tank units

B. Soft Component

Procured facility is planned content based on capability of beneficiaries. However beneficiary's capability for operation and maintenance is partially seems insufficient, therefore soft component activity shall be introduced to support for improvement of their capacity.

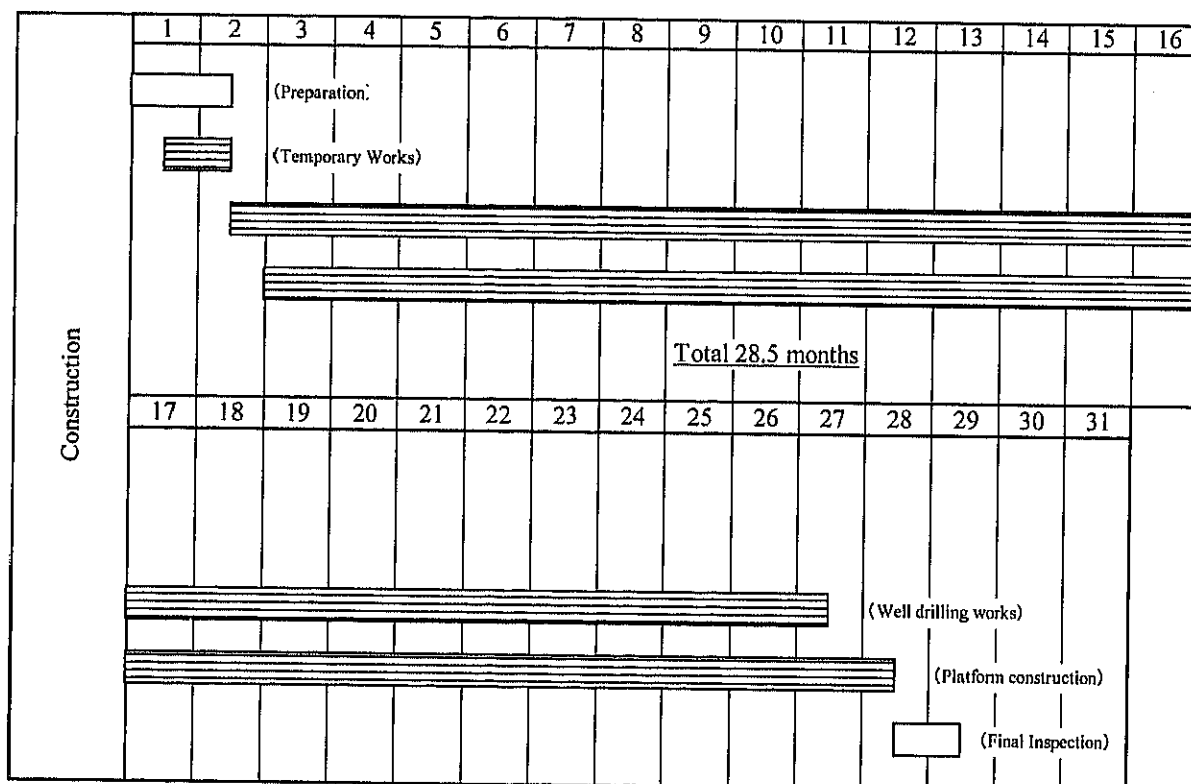
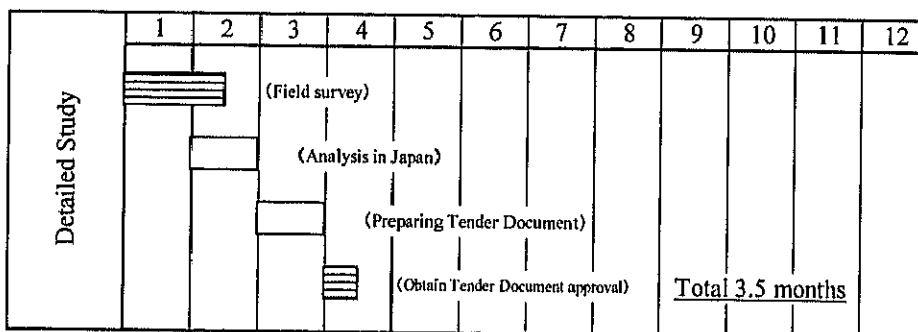
Output of the activities shall be confirmed by a beneficiary participation activity report, beneficiary meeting report, accounting training (C/P staff and person in charge) report, users' regulations, technical training report (C/P staff and person in charge) and guidance visit report.

3. Implementation Schedule and Project Cost Estimation

(1) Implementation schedule

The implementation schedule of this project is shown below:

Table 2: Implementation schedule



(2) Project Cost Estimation

This cost estimate is provisional and is to be further examined by the Government of Japan for approval of the Grant.

- Obligation of Tanzanian side

The following cost shall be born by the Tanzanian side.

44,150,000 TSH (Approximately 4.49 million JPY)

Description	Amount (TSH)
Bank commission	8,450
Participation of C/P staff in the Project	-
Bear indirect cost for C/P staff	35,700
Planting vegetation on the platform slope	-
Installation of fence around platform	-
Extension of drainage	-

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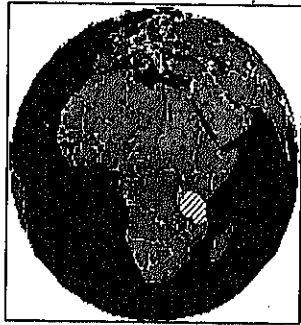
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United Republic of Tanzania

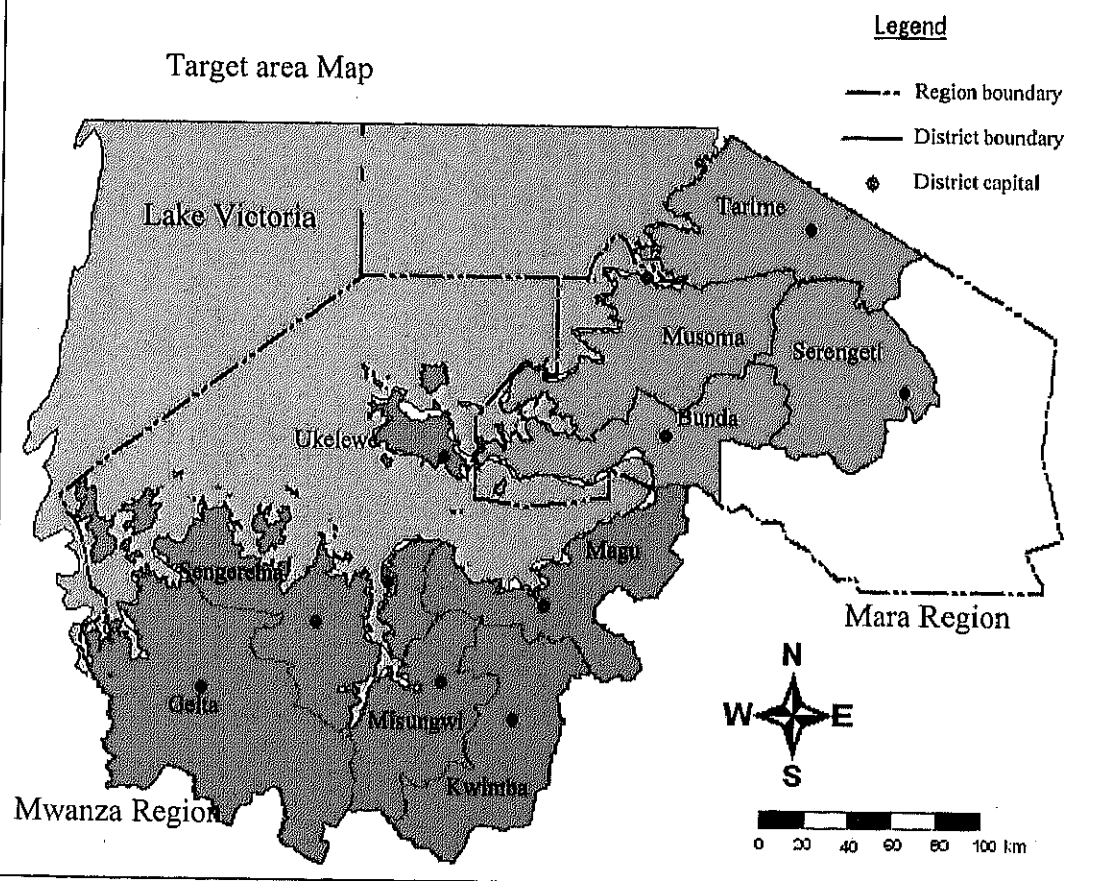


Mwanza

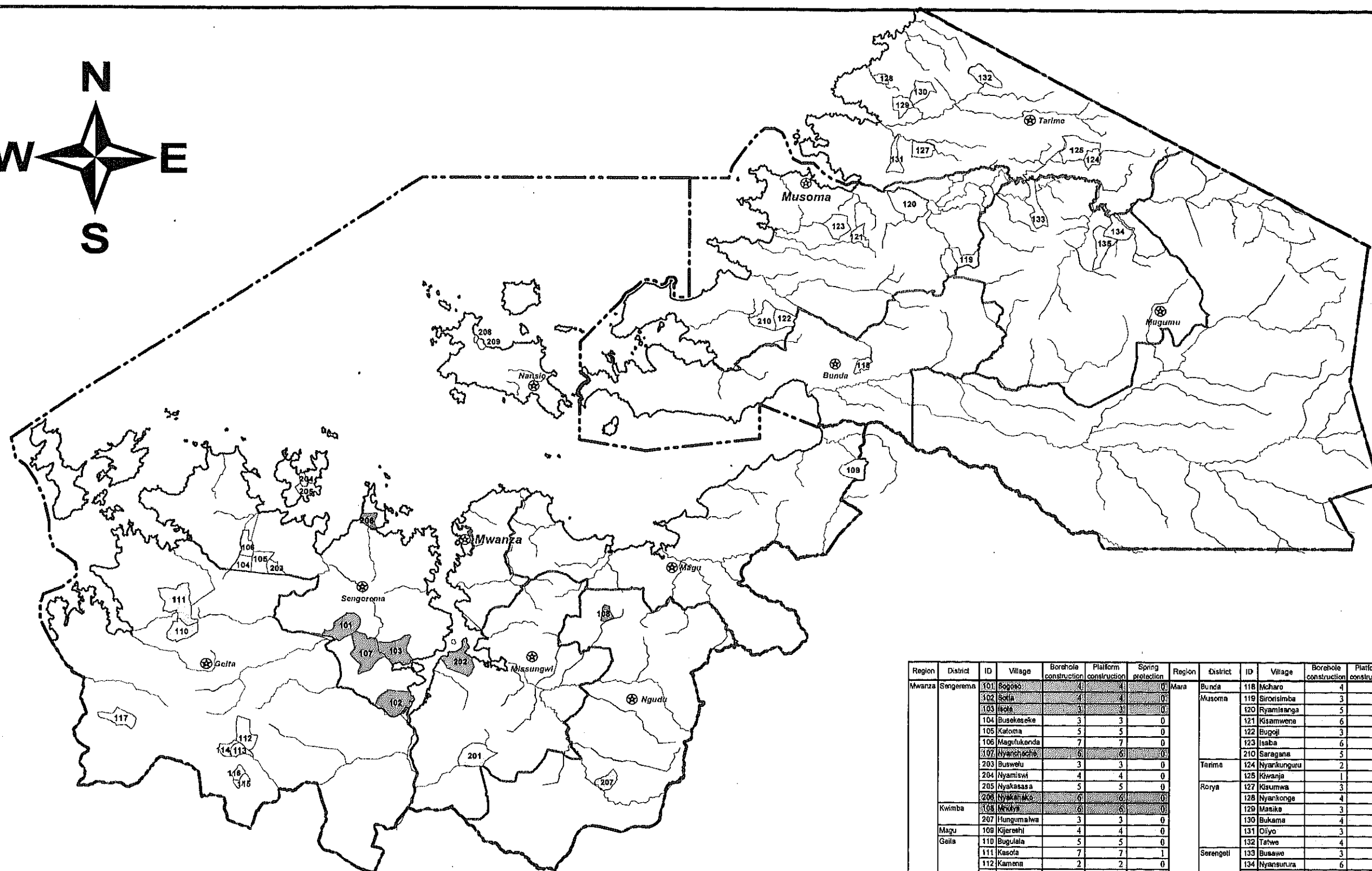
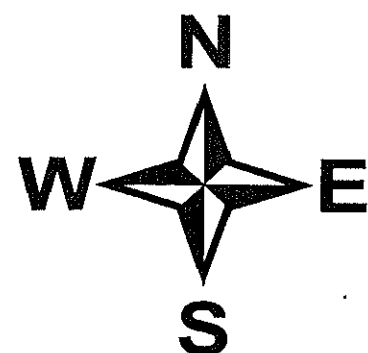
Mara



Target area Map



Target area map



	Mwanza				Mara				Total			
	Number of Village	Borehole construction	Platform construction	Spring Protection	Number of Village	Borehole construction	Platform construction	Spring Protection	Number of Village	Borehole construction	Platform construction	Spring Protection
Phase 1	7	34	34	0	0	0	0	0	7	34	34	0
Phase 2	10	38	40	1	12	42	42	0	22	80	82	1
Phase 3	9	36	36	0	6	27	30	0	15	63	66	0
Total	26	108	110	1	18	69	72	0	44	177	182	1

Region	District	ID	Village	Borehole construction	Platform construction	Spring protection	Region	District	ID	Village	Borehole construction	Platform construction	Spring protection	
Mwanza	Sengerema	101	Bogogo	4	4	0	Mara	Bunda	118	Mcharo	4	5	0	
		102	Bofia	4	4	0			Musoma	119	Sirorisimba	3	3	0
		103	Isola	3	3	0				120	Ryamitanga	5	5	0
		104	Busekekeke	3	3	0				121	Kisamwena	6	6	0
		105	Katoma	5	5	0				122	Bugoji	3	3	0
		106	Magufukenda	7	7	0				123	Isaba	6	6	0
		107	Nyankhacha	6	6	0		Tarime		210	Saragana	5	7	0
		203	Buswele	3	3	0			124	Nyankunguru	2	2	0	
		204	Nyamisiwi	4	4	0			125	Kiwanga	1	1	0	
		205	Nyakasasa	5	5	0			Rorya	127	Kisumwa	3	3	0
		206	Nyankhacha	6	6	0				128	Nyankonge	4	4	0
		Kwimba	108	Mwitya	6	6				0	129	Masike	3	3
			207	Hungumalwa	3	3		0		130	Bukama	4	4	0
		Magu	109	Kijerehi	4	4		0	Sengerema	131	Oliyo	3	3	0
	Gaika		110	Bugulala	5	5	0	132		Tatwe	4	4	0	
		111	Kasola	7	7	1	133	Buawe		3	3	0		
		112	Kamena	2	2	0	134	Nyansurura		6	6	0		
		113	Ndelema	1	1	0	135	Kobancha		4	4	0		
		114	Nyashishima	2	2	0								
		115	Bogogo	3	3	0								
		116	Mina	2	3	0								
		117	Ibondo	8	8	0								
	Misungwi	201	Buongo	5	6	0								
		202	Narya	5	5	0								
	Ukerewe	208	Bukonyo	2	2	0								
		209	Nanilembe	3	3	0								
	Total				108	110	1	Total				60	73	

Phase 1 Phase 2 Phase 3



Perspective

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Abbreviations

C/P	Counter Part
DDCA	Drilling and Dam Construction Agency
DTH	Down The Hole Hammer
DWE	District Water Engineer's Office
GBS	General Budget Support
GDP	Gross Domestic Products
HESAWA Project	Health through Sanitation and Water Project
JICA	Japan International Corporation Agency
LGRP	Local Government Reform Programme
MDGs	Millennium Development Goals
MoH	Ministry of Health
MoWI	Ministry of Water and Irrigation
NGO	Non Governmental Organization
NRWSSP	National Rural Water Supply and Sanitation Program
PDM	Project Design Matrix
PRSP	Poverty Reduction Strategy Paper
RWE	Regional Water Engineer's Office
SIDA	Swedish International Development Authority
SWAp	Sector Wide Approach
TSH	Tanzania Shilling
UNICEF	The United Nations Children's Fund
VAT	Value Added Tax
VWC	Village Water Committee
WHO	World Health Organization
WSBF	Water Sector Basket Fund
WSDP	Water Sector Development Program
WSUG	Water and Sanitation Users' Group

Chapter 1 Background of the Project

Chapter 1. Background of the Project

1-1 Background of the Project

Traditional hand dug and shallow wells make up 70% of water supply facilities in the Mwanza and Mara regions in this project. Most of the piped water supply facilities were constructed in 1970's or earlier and have deteriorated, especially facilities which use lake water, to the point that 63% of the facilities are unable to supply water. Furthermore, considering the rising population, it is not possible to keep pace with development and maintenance of the facilities. This leaves a large number of people unable to obtain safe water easily and leads to the spread of waterborne disease and problems for women and children left with the burden of travelling long distances to fetch water. The water supply rate is 51% (2005) in the Mwanza region and 45% (2005) in the Mara region; far from the 52% nationwide average in Tanzania. This potentially could result in a situation in which one out of two persons is left without safe water, and therefore urgently requires improvement of the water supply facilities in the target area.

In order to improve this situation, the government of Tanzania has set a target for people to be able to obtain safe water within 400m of their residence by 2025. This project will contribute to raise the current water supply ratio in the target area.

1-2 Natural Condition

Tanzania is located in the eastern part of Africa. It covers an area of 884,000km² and has a population of 39.5 million. The target area is located in the Mwanza and Mara regions, which face Lake Victoria. Both regions are located on the plateau with lowest altitude is 1,134m on the surface of Lake Victoria. The climate is relatively warm in comparison with the shoreline. In addition, the annual mean rainfall of both regions is 946mm and the annual mean air temperature is 24.5 degrees. Meanwhile, the annual mean rainfall at the observatories is 946mm. The dry season is from July to September, and the rainy season is from November to April of the following year.

The geological formations observed in the Project area can generally be divided into the three units by age. The target villages consist of the above geological division depending on the geological survey in the field. The aquifer can be divided into two units, given below.

- **Stratum aquifer:** unconfined, semi-confined aquifer at a depth range of 20-50m bgsI in the decomposed (weathered) or secondary deposited Precambrian hard rocks (mainly granite)
- **Fissure water:** semi-confined, confined aquifer at a depth range of 20-150m bgsI in the

fractures and fissures distributed in the hard rocks (mainly granite)

1-3 Environmental and Social Consideration

The categories of “Economical and Financial”, “Organization and Systems” and “Natural and Environment condition” were evaluated and it was confirmed that each category was appropriate for the priority project during the development study on rural water supply in Mwanza and Mara region (2004-2006). Furthermore, Initial Environmental Evaluation (IEE) was conducted in the development study, and was evaluated by the Ministry of Environment (MoE) with the comment that an “Environmental Impact Assessment (EIA)” would not be required and categorized into “Environmental category C”.