Appendices

1. *Member List of the Study Team*

1. Member List of the Study Team

No.	Job Title	Name	Organization
1	Leader	Kazunori MIURA	Director, Project Monitoring and Coordination Division, Grant Aid Management Dept., Japan International Cooperation Agency (JICA)
2	Coordinator	Hidetake AOKI	First Project Management Div., Grant Aid Management Dept., Japan International Cooperation Agency (JICA)
3	Chief consultant/ Operation and Maintenance Planner A	Akira KAMATA	Overseas Operations Department Kokusai Kogyo Co., Ltd.
4	Groundwater Development Planner/ Water Quality Surveyor	Naoaki SHIBASAKI	Overseas Operations Department Kokusai Kogyo Co., Ltd
5	Water Supply Facility/ Facility Designer	Satoshi ISHIDA	Overseas Operations Department Kokusai Kogyo Co., Ltd
6	Sociologic Surveyor / Operation and Maintenance Planner B	Shoji MASUMURA	Overseas Operations Department Kokusai Kogyo Co., Ltd
7	Equipment Planner	Hisayuki UKISHIMA	Overseas Operations Department Kokusai Kogyo Co., Ltd
8	Construction and Procurement Planner/ Cost Estimator	Masahiko IKEMOTO	Overseas Operations Department Kokusai Kogyo Co., Ltd
9	Coordinator/ Resident Participatory Planner	Hiromi YAMAUCHI	Overseas Operations Department Kokusai Kogyo Co., Ltd

2. *Study Schedule*

2. Study Schedule

No.	Date	Day	Place	JICA	Consultant					
				Miura/Aoki	Kamata/Ishida	Shibasaki	Ikemoto	Masumura	Yamauchi	Ukishima
1	11/23	Sat	Dar es salaam	Meeting	Tokyo→ Dar es salaam					
2	11/24	Sun	〃	Dar es salaam→ Arusha						
3	11/25	Mon	〃	Meeting, Collecting information						
4	11/26	Tue	〃	〃						
5	11/27	Wed	〃	Signing the minute by MoWL Arusha→Dar es salaam						
6	11/28	Thur	〃	Signing the minute by Ministry of Finance						
7	11/29	Fri	〃	Dar es salaam→ (via Europe)	Meeting with local consultant					
8	11/30	Sat	〃	Arrive at Narita	Collecting information	Tokyo → Dar es salaam				
9	12/1	Sun	〃		Meeting in the team					

No	Date	Day	Place	Kamata/Ishida	Shibasaki	Ukishima	Ikemoto	Masumura	Yamauchi
10	12/2	Mon	Dar es salaam	Meeting with local consultant Meeting with JICA		Tokyo→ Dar es salaam	Meeting with local consutant Meeting with JICA		
11	12/3	Tue	Mtwara	Dar es salaam → Mtwara					
12	12/4	Wed	〃	Meeting with RWE Mtwara					
13	12/5	Thur	〃	Field survey					
14	12/6	Fri	〃	〃					
15	12/7	Sat	〃	〃					
16	12/8	Sum	〃	Document study, Preparaton of the Stud y					
17	12/9	Mon		Meeting with RWE Lindi, Field survey				Meeting with RWE Lindi, Lindi→Kilwa	
18	12/10	Tue	Mutwara/ Dar es	Field survey				Kilwa → Dar es salaam	
19	12/11	Wed	〃	〃				Collecting info.	Sick leave
20	12/12	Thur	〃	〃				〃	〃
21	12/13	Fri	〃	〃				Hearing to MoWL	
22	12/14	Sat	〃	〃				Document study	
23	12/15	Sun	〃	Mtwara→Dar es	Document study	Mtwara→Dar es salaam		〃	
24	12/16	Mon	〃	MoWL	Field survey	Study on equipment		MoWL	
25	12/17	Tue	〃	〃	〃	〃		Dar es→Mtwara	MoWL
26	12/18	Wed	〃	CONCERN MoWL	〃 〃	〃 〃		Social Study 〃	CONCERN
27	12/19	Thur	〃	MoWL	〃	〃		〃	MoWL
28	12/20	Fri	〃	Worl Bank	〃	〃		〃	Climate data collect
29	12/21	Sat	〃	Document study	〃	〃		〃	Document study
30	12/22	Sun	〃	Dar→Mtwara	Document study	〃		〃	Dar→Mtwara
31	12/23	Mon	〃	Field survey	Pepare Water analysis	〃		〃	Pepare wate analysis
32	12/24	Tue	〃	〃	Water analysis	〃		〃	Water analyis
33	12/25	Wed	〃	〃	Field survey	〃		〃	Field survey
34	12/26	Thur	〃	〃	〃	〃		〃	〃
35	12/27	Fri	〃	〃	〃	〃		〃	〃
36	12/28	Sat	〃	Meeting on selection of villages		〃		Meeting	Water analyis
37	12/29	Sum	Mtwara	Meeting in the team		Dar es→	Dar es→Mtwara		
38	12/30	Mon	〃	Report of study results to RWE Lindi		via Europe)	Report to RWE Lindi		Water analyis
39	12/31	Tue	〃	Report of study results to RWE Mtwara		Arrive at Narita	Report to RWE Wtwara		
40	1/1	Wed	〃	Document study			Document study		
41	1/2	Thur	Mtwara/ Dar es	Mtwara→Dar es	Field survey		Mtwara→Dar es	Social survey	Water analysis
42	1/3	Fri	〃	Report to MoWL,JICA	〃		Equipment study	〃	〃
43	1/4	Sat	〃	Dar es→	〃		〃	〃	〃
44	1/5	Sun	〃	(via Europe)	〃		〃	Document study	
45	1/6	Mon	〃	Arrive at Narita	〃		〃	Social survey	Water analysis
46	1/7	Tue	〃		〃		〃	Mtwara→Dar es	
47	1/8	Wed	〃		〃		〃	Report to JICA	
48	1/9	Thur	Dar es		Mtwara→Dar es		〃	DDCA, MoWL	
49	1/10	Fri	〃		Document study		〃	Collect inforamtion	
50	1/11	Sat			Dar es→		Dar es salaam→		
51	1/12	Sun			via Europe)		(via Europe)		
52	1/13	Mon			Arrive at Narita		Arrive at Narita		

3. *List of Parties Concerned in the Recipient Country*

3. List of Parties Concerned in the Recipient Country

Ministry of Water and Livestock Development (MoWLD)

Edward Lowassa	Minister
Bakari A. Mahiza	Permanent secretary
C. Sayi	Director, Department of Rural Water Supply Development
Reuben N. Kwigizile	Assistant director, Design Supervision
Lister Kongola	Assistant director, Water Resource Division
E.C. Mziray	Assistant director, Operation and Management
Mbwera M. Salehe	Senior technician
H. Mjengera	Director, Water laboratory
Devid Kubezya	Architect
Alex Musilanga	
J.A. Mukumwa	Assistant director, Construction and Monitoring RWS
Felix Ngamlangosi	Economist, Policy and Planning Division

Driling and Dam Construction Agency (DDCA)

Mohamed A. H	Managing Director
N. N. Lupimo	Technical manager
Ernest Mziray	Drilling supervisor

Regional Water Engineer (RWE)

<RWE Mtwara>

Shaibu H. Geugeu	Regional Water Engineer, Water Department
John A. Luhombo	Technician, Hydrology Section
Aziz Chilbemba	Design engineer
Beda L. Mapunda	Engineer, Planning Section
Moshi Katunge	Technician, Hydrology Section

<RWE Lindi>

Monjesa Yohana F.A.	Regional Water Engineer
Maulid Nkrumah	Regional Hydrogeologist
Bakari A. Mbinge	Mechanical Engineer
Banda K. Issa	Civil Technician

District Water Engineer

<DWE Mtwara>

Chales W. Malisa	District Water Engineer
Selemani J. Libaba	Assistant DWE Mtwara

<DWE Tamdahimba>

Amos Mtweve	District Water Engineer

<DWE Newala>

Fidelis Mayonbo	District Water Engineer
Herman Christopher Chilumba	Assistant District Water Engineer

<DWE Masasi>

Rashidi Nambuta	Ag. District Water Engineer

<DWE Kilwa >

Fromence. F. Matem	District Water Engineer

<DWE Nachingwea >

Robert Mnkyaua	District Water Engineer
Bartholomew Matwiga	Acting District Water Engineer

<DWE Ruangwa >

Valentine Ndyano	District Water Engineer
Selemani J. Ngitu	Assistant Water Engineer

<DWE Liwale >

Charles Isonde	District Water Engineer

Makonde Water Supply Scheme

Bernold Mlanji	Resident Engineer
Athumani Senkondo	Technician Electrical Engineer
Seleman Namele	Civil Technician

The President's Office

Mathias Bazi Kabunduguru	Assistant Director, Policy Development Division

Prime Minister's Office

Bernard M. Ulaya	Zonal Monitoring & Evaluation Officer, Northern Zone

Ministry of Finance in the United Republic of Tanzania

Joyce K.G. Mapunjo	Ag. Commissioner of External Finance
Paul A. Mwafongo	Assistant Commissioner, Bilateral cooperation
Joyce Momburi	Finance management officer

District Council

<Tamdahimba District>

Sarah Linuma,District	Executive Director
Hen Mbelenje	Mkwiti ward councilor

<Newala District>

Kitanga Eliya	District Planning Officer, Acting District Executive Director

<Ruangua DistrictAdministration Office>

M. A. S. Nididi	District Administrative Secretary
W. L. Itala	District Planning Officer

CONCERN

Steve Levine	Country Director
Richard M. Evans	Water and Sanitation Advisor
Niger Tricks,	Programme Manager, CONCERN Mtwara

Japanese Embassy

Kazuhiro Dekiba	Minister
Takamichi Okabe	Counselor
Hiroyuki Kashimura	Second Secretary

JICA Tanzania Office

Sumio Aoki	Resident Representative
Hiroyuki Kinomoto	Deputy Resident Representative
Kaori Matsushita	Assistant Resident Representative
Tomoki Kobayashi	Assistant Resident Representative

Deborah Sungusia	Programme Officer
Kunio Fujiwara	JICA Expert

Nihon Techno Co., Ltd.

Kiyoko Takamizawa	Project Engineer, Project Department No.2

4. *Minutes of Discussions*

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY
ON
THE RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS
IN THE UNITED REPUBLIC OF TANZANIA

In response to a request from the Government of the United Republic of Tanzania (hereinafter referred to as "Tanzania"), the Government of Japan decided to conduct a Basic Design Study on THE RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Tanzania the Basic Design Study Team (hereinafter referred to as "the Team"), which was headed by Mr. Kazunori MIURA, Director, Project Monitoring and Coordination Division, Grant Aid Management Department, JICA. The Team is scheduled to stay in the country from November 22, 2002 to January 11, 2003.

The Team held discussions with the officials concerned of the Government of the United Republic of Tanzania and will conduct a field survey in the study area.

In the course of discussions, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Arusha, November 27, 2002

三浦和紀

Mr. Kazunori MIURA
Leader
Basic Design Study Team
Japan International Cooperation Agency
Japan

Mr. Bakari A. Mahiza
Permanent Secretary,
Ministry of Water and Livestock
Development (MoWLD),
The United Republic of Tanzania

Witness

Mapunjo

Mrs. Joyce K. G. Mapunjo
Ag. Commissioner of External Finance,
Ministry of Finance
The United Republic of Tanzania

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve the living standard of rural population by means of development of groundwater supply for drinking.

2. Project sites

The sites of the Project are the selected villages in Lindi and Mtwara Regions.

3. Responsible and Implementing Agency

The responsible and implementing agency is the Ministry of Water and Livestock Development (MoWLD).

4. Items requested by the Government of Tanzania

1) The sites and equipment requested by the Tanzanian side are listed in **Annex-I** and **Annex-II**. The Tanzanian side also requested technical assistance in the soft component programme for capacity building for the Ministry, the regions, the districts, the communities. JICA will assess the appropriateness of the request and will recommend it to the Government of Japan for approval. However, the components of the Project will be decided by the Government of Japan during the basic design study.

1) Both sides agreed that the Project sites and the components would be further examined during the basic design study taking into consideration the proposed criteria and the flow chart as described in **Annex-III** and **Annex-IV** respectively. Both sides also agreed that additional criteria would be adopted in the course of the study if found necessary.

3) The Team explained that the number of villages for the Project might be reduced from the requested 100 due to budgetary constraints. However, both sides agreed to cover as many villages as possible by considering the following items;

i) Exploratory boreholes shall be drilled to confirm the availability of the groundwater in villages with poor resource potential during detailed design stage.

ii) The existing water supply facilities that have been deteriorating shall be re-used or rehabilitated in order to reduce the construction cost.

iii) The design of water supply facilities shall be as simple as possible in order to save the construction cost for each village, and operation and maintenance cost.

iv) In order to reduce the Project cost, the Tanzanian contractors shall construct water supply facilities for some of the villages under the Project with technical supervision and material supply financed by the Grant if the capability of local contractors is confirmed. The Tanzanian side will be responsible for engaging local contractors.

v) The Tanzanian side expressed its desire to cover more villages identified in the feasibility study because the communities have high expectations of the

support. It was therefore proposed that priority shall be given to construction of facilities among the Project components requested.

5. Japan's Grant Aid Scheme

The Tanzanian side understood Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Tanzania as explained by the Team and described in Annex-V and Annex-VI.

6. Schedule of the Study

1) The Team will proceed with the study in Tanzania until January 11, 2003.
2) JICA will prepare the Draft Final Report in English and dispatch a mission in order to explain its contents in April 2003.
3) In case that the content of the report is accepted in principle by the Government of Tanzania, JICA will complete the Final Report and send it to the Government of Tanzania by the end of June 2003.

7. Operation and Maintenance (O/M)

1) The Tanzanian side explained that the beneficiaries are responsible for paying for their water supply services as described in the approved Water Policy (2002). The Tanzanian side assured that the costs of O/M of the water facilities would be covered entirely by beneficiaries.
2) The Regional Water Engineers (RWEs) and the District Water Engineers (DWEs) explained that the existing facilities are properly operated, including the ones constructed during the pilot project in the stage of feasibility study, and the funds for O/M have been deposited in the village water accounts.
3) Village Water Committees (VWCs) and Water Point Committees (WPCs) which have been established should be strengthened.

8. Drilling and Dam Construction Agency (DDCA)

The Tanzanian side explained that DDCA is a semi-governmental authority and is entrusted by the Government of Tanzania to drill boreholes and to construct dams.

9. Coordination of the donors

1) The Tanzanian side explained the involvement of other donors in the rural subsector. Germany in Kilimanjaro Region, the Netherlands in Shinyanga Region, ADB in Monduli District, France in 6 district head quarters in the central areas, China in Coast Region, World Bank in 12 districts in the central areas, NGO for assistance to district councils (Water Aid for Dodoma, Arusha, Singida and Tabora, CONCERN for Mtwara and Lindi, World Vision for Arusha, Shinyanga and Tanga).
2) CONCERN is assisting different villages other than the Project sites.

3) The Tanzanian side mentioned that there is no duplication of the projects by other donors in the Project sites.

10. Other relevant issues

1) Both sides agreed in principle to adopt the Tanzanian water quality standard and to consider WHO guidelines for items which have high health risks.

2) The Tanzanian side explained that RWEs and DWEs belong to the Regional Administration and District Councils respectively, under administrative supervision of the President's Office Regional Administration and Local Government, although they are technically supervised by MoWLD.

3) The Tanzanian side explained the importance of supporting ongoing decentralization process. It is therefore important to build the capacity of DWE offices in the Project area.

Project Sites Requested by the Government of Tanzania (1/2)

Annex-I

No.	Region	District	Division	Ward	Village	Facility type	Required number of borehole well
1	Mtwara	Mtwara	Nanyamba	Nanyamba	Mbembaleo	Level 2	1
2	Mtwara	Mtwara	Nanyamba	Mtiniko	Maranje	Level 2	1
3	Mtwara	Mtwara	Nanyamba	Mtiniko	Mtiniko	Level 2	1
4	Mtwara	Mtwara	Nanyamba	Mtiniko	Malamba	Level 2	1
5	Mtwara	Mtwara	Ziwani	Ziwani	Ziwani	Level 2	0
6	Mtwara	Mtwara	Ziwani	Nalingu	Msimbati	Level 1	5
7	Mtwara	Mtwara	Ziwani	Nalingu	Msangamkuu	Level 1	5
8	Mtwara	Mtwara	Ziwani	Nanguruwe	Nanguruwe	Level 2	1
9	Mtwara	Mtwara	Ziwani	Nanguruwe	Mbawala	Level 2	1
10	Mtwara	Mtwara	Mayanga	Mayanga	Kawawa	Level 1	5
11	Mtwara	Mtwara	Kitaya	Kitaya	Kitaya	Level 2	1
12	Mtwara	Mtwara	Kitaya	Kitaya	Arusha Chini	Level 2	0
13	Mtwara	Mtwara	Kitaya	Kiromba	Mayembe Juu	Level 2	1
14	Mtwara	Mtwara	Kitaya	Mahurunga	Kitumguli	Level 2	1
15	Mtwara	Mtwara	Kitaya	Mahurunga	Mahurunga		
16	Mtwara	Mtwara	Dihimba	Dihimba	Dihimba	Level 2	1
17	Mtwara	Mtwara	Dihimba	Dihimba	Mpondomo		
18	Mtwara	Tandahimba	Namikupa	Mihambwe	Mihambwe	Level 2	1
19	Mtwara	Tandahimba	Namikupa	Kitama	Kitama	Level 2	1
20	Mtwara	Tandahimba	Namikupa	Kitama	Mitondi A	Level 2	1
21	Mtwara	Tandahimba	Namikupa	Mkoreha	Misutini	Level 2	1
22	Mtwara	Tandahimba	Litehu	Luagala	Litehu	Level 2	1
23	Mtwara	Tandahimba	Litehu	Luagala	Mmeda	Level 2	1
24	Mtwara	Tandahimba	Litehu	Luagala	Mabeti	Level 2	1
25	Mtwara	Tandahimba	Litehu	Mkwiti	Mkwiti Chini	Level 2	0
26	Mtwara	Tandahimba	Litehu	Ngunja	Namindondi Juu	Level 2	0
27	Mtwara	Tandahimba	Litehu	Ngunja	Nanjanga	Level 2	1
28	Mtwara	Tandahimba	Litehu	Ngunja	Mkuti	Level 2	1
29	Mtwara	Newala	Newala	Nanguruwe	Mnanje	Level 2	1
30	Mtwara	Newala	Newala	Mnekachi	Kilidu	Level 2	1
31	Mtwara	Newala	Chilangala	Mnyambe	Mnima	Level 2	1
32	Mtwara	Newala	Chilangala	Chilangala	Miyuyu	Level 2	1
33	Mtwara	Newala	Chilangala	Chilangala	Namangudu	Level 2	1
34	Mtwara	Newala	Kitangari	Kitangari	Mitanga	Level 2	1
35	Mtwara	Newala	Kitangari	Kitangari	Likwaya	Level 2	1
36	Mtwara	Newala	Kitangari	Malatu	Malatu Juu	Level 2	1
37	Mtwara	Newala	Kitangari	Mchemo	Mdimba	Level 2	1
38	Mtwara	Newala	Kitangari	Chiwonga	Chiwonga	Level 2	1
39	Mtwara	Newala	Kitangari	Chiwonga	Mmulunga	Level 2	1
40	Mtwara	Masasi	Chikundi	Nanganga	Nanganga	Level 2	1
41	Mtwara	Masasi	Lisekese	Lisekese	Namkungwi	Level 2	1
42	Mtwara	Masasi	Lisekese	Mikangaula	Kilosa	Level 2	1
43	Mtwara	Masasi	Lisekese	Namatutwe	Chikoweti	Level 2	1
44	Mtwara	Masasi	Lisekese	Namatutwe	Mlingula	Level 2	1
45	Mtwara	Masasi	Lisekese	Lukuledi	Chiwale	Level 2	1
46	Mtwara	Masasi	Nanyumbu	Nanyumbu	Nanyumbu	Level 1	4
47	Mtwara	Masasi	Nanyumbu	Nanyumbu	Namasogo	Level 2	1
48	Mtwara	Masasi	Lulindi	Namalenga	Msanga	Level 2	1
49	Mtwara	Masasi	Chiungutwa	Chiungutwa	Mpeta	Level 2	1
50	Mtwara	Masasi	Chiungutwa	Mbuyuni	Mitonji	Level 2	1
Sub total	1 region	4 districts			50 villages		59

Project Sites Requested by the Government of Tanzania (2/2)

Annex-I

No.	Region	District	Division	Ward	Village	Facility type	Required number of borehole well
51	Lindi	Kilwa	Pwani	Kikole	Migeregere	Level 2	1
52	Lindi	Kilwa	Miteja	Tingi	Mtandango	Level 1	3
53	Lindi	Kilwa	Miteja	Kinjumbi	Somago Ndumbo	Level 2	1
54	Lindi	Kilwa	Pande	Pande Mikoma	Pande Plot	Level 2	1
55	Lindi	Kilwa	Pande	Pande Mikoma	Mtitimira	Level 1	3
56	Lindi	Kilwa	Pande	Lihimalyoao	Lihimalyoao	Level 2	1
57	Lindi	Kilwa	Pande	Lihimalyoao	Namakongoro	Level 1	5
58	Lindi	Kilwa	Pande	Mandawa	Mandawa	Level 2	1
59	Lindi	Kilwa	Pande	Mandawa	Kiwawa	Level 2	1
60	Lindi	Lindi	Mtama	Nyangao	Chiwerere	Level 1	5
61	Lindi	Lindi	Mtama	Nyengedi	Nyengedi	Level 2	1
62	Lindi	Lindi	Mtama	Nyengedi	Mtumbya	Level 2	1
63	Lindi	Lindi	Mtama	Mtua	Kilimahewa(Muta)	Level 2	0
64	Lindi	Lindi	Sudi	Sudi	Madangwa	Level 2	0
65	Lindi	Lindi	Sudi	Sudi	Hingewali	Level 2	1
66	Lindi	Lindi	Nyangamara	Nyangamara	Madingo	Level 2	1
67	Lindi	Lindi	Nyangamara	Mandwanga	Chiuta	Level 2	1
68	Lindi	Lindi	Nyangamara	Mandwanga	Malungo	Level 1	5
69	Lindi	Lindi	Mingoyo	Kiwalala	Kiwalala	Level 2	1
70	Lindi	Lindi	Mingoyo	Mnolela	Mnolera	Level 2	1
71	Lindi	Lindi	Rondo	Chiponda	Chiodya	Level 2	0
72	Lindi	Lindi	Ngapa	Ngapa	Kinengene	Level 2	1
73	Lindi	Lindi	Mchinga	Mchinga	Kilangala	Level 2	1
74	Lindi	Lindi	Mchinga	Kilolombwani	Kilolombwani	Level 1	4
75	Lindi	Lindi	Mipingo	Mipingo	Lihimilo	Level 2	1
76	Lindi	Lindi	Nangaru	Chikonji	Chikonji	Level 2	1
77	Lindi	Ruangwa	Ruangwa	Malolo	Nanganga	Level 2	1
78	Lindi	Ruangwa	Ruangwa	Likunja	Chilangalile	Level 1	3
79	Lindi	Ruangwa	Ruangwa	Narun'gombe	Machanganja	Level 2	1
80	Lindi	Ruangwa	Ruangwa	Narun'gombe	Liuguru	Level 2	1
81	Lindi	Ruangwa	Ruangwa	Namichiga	Mihewe	Level 1	3
82	Lindi	Ruangwa	Mnacho	Luchelegwa	Chinongwe	Level 2	1
83	Lindi	Ruangwa	Mnacho	Luchelegwa	Litama	Level 2	1
84	Lindi	Ruangwa	Mnacho	Luchelegwa	Likwachu	Level 2	1
85	Lindi	Ruangwa	Mnacho	Luchelegwa	Ipingo	Level 1	3
86	Lindi	Ruangwa	Mandawa	Mandawa	Chibula	Level 2	1
87	Lindi	Nachingwea	Mnero	Mnero Miembeni	Mkonjela	Level 2	1
88	Lindi	Nachingwea	Ruponda	Marambo	Litula	Level 1	5
89	Lindi	Nachingwea	Ruponda	Mkoka	Rweje	Level 1	5
90	Lindi	Nachingwea	Nambambo	Naipanga	Naipanga	Level 2	1
91	Lindi	Nachingwea	Nambambo	Naipanga	Chiumbati Miembeni	Level 2	1
92	Lindi	Nachingwea	Nambambo	Mkotokuyama	Mandai	Level 2	1
93	Lindi	Nachingwea	Nambambo	Ndomoni	Ndomoni	Level 2	1
94	Lindi	Nachingwea	Nambambo	Mtua	Kipara Mtua	Level 2	1
95	Lindi	Nachingwea	Nambambo	Mpiruka	Mpiruka	Level 2	1
96	Lindi	Liwale	Barikiwa	Mlembwe	Mlembwe	Level 1	5
97	Lindi	Liwale	Liwale	Liwale B	Mikunya	Level 1	4
98	Lindi	Liwale	Liwale	Mihumo	Mihumo	Level 2	1
99	Lindi	Liwale	Liwale	Mbaya	Mbaya	Level 2	1
100	Lindi	Liwale	Liwale	Ngongowele	Ngongowele	Level 1	4
Sub total	1 region	5 districts			50 villages		90
Total	2 region	9 districts			100 villages		149

Equipment Requested By the Government of Tanzania

Annex-II

No.	Description	Unit	Quantity	Remark
1	Drilling Equipment			
1-1	Supplement of spare parts of FSW-7T-L37	lump sum	1	for Ministry owned equipment
1-2	Drilling rig with supporting equipment and vehicles	set	1	capable to drill deep wells of 300m
2	Equipment for Periodical Patrol Services			
2-1	4x4 light weight vehicles	set	9	for 9 district water engineer office
2-2	maintenance tools	set	9	ditto
3	Equipment for Survey			
3-1	for pumping test	set	2	for 2 regional water engineer office
3-2	for well logging	set	2	ditto
3-3	for well cleaning	set	2	ditto
3-4	for geophysical survey	set	3	ditto
3-5	for water quality analysis	set	3	ditto
3-6	4x4 light weight vehicles	set	2	for mobilization of survey equipment
3-7	computers accessories	set	8	for Ministry and regional water office

Annex-III

CRITERIA FOR SELECTION OF THE PROJECT SITES AND COMPONENT OF FACILITIES

Water sources

1) Raw water quality of groundwater meets the WHO / Tanzanian standard.
2) Depth to the water table is not beyond practical and economical pumping range.

Facilities

3) There is not either safe or sufficient existing water supply facility.
4) There are existing water supply facilities which can be rehabilitated.

Socio-economical situations

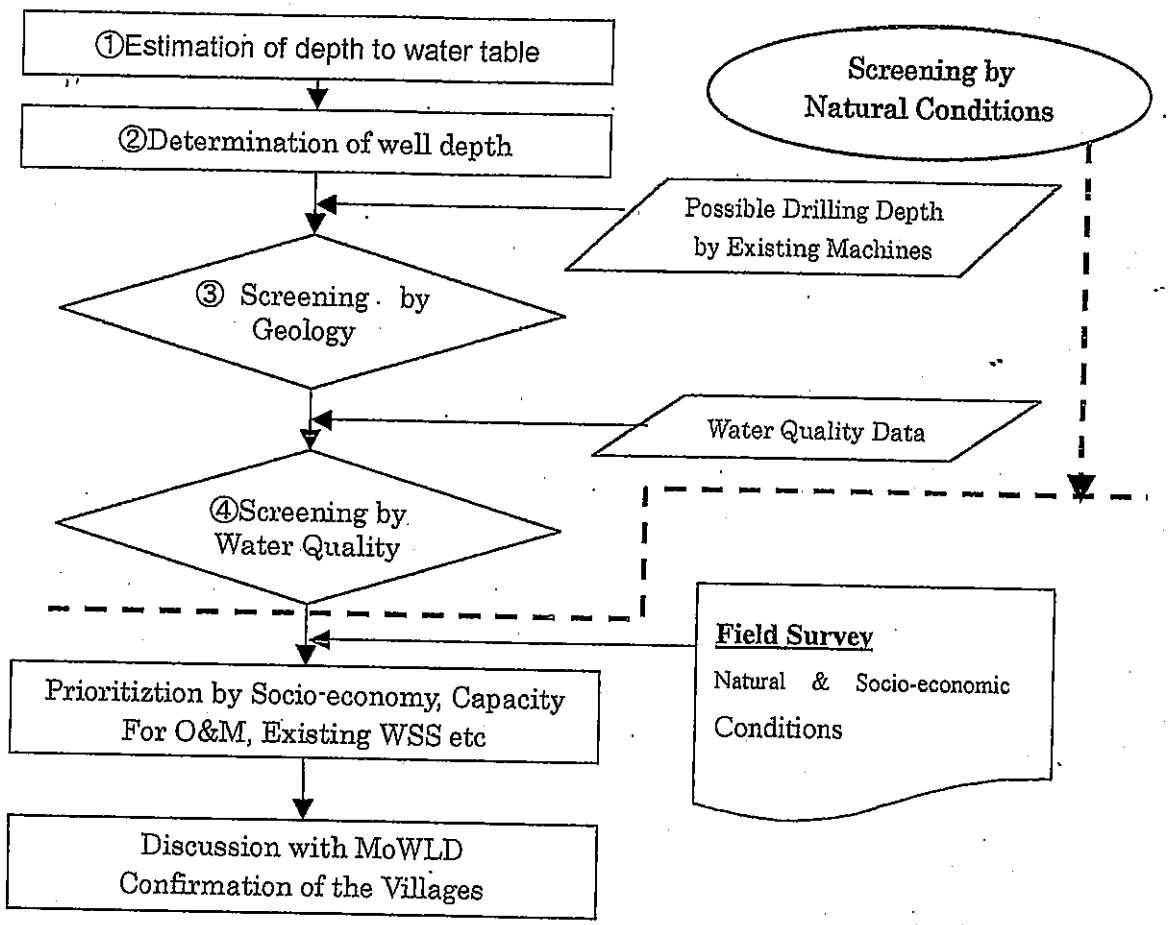
5) VWC and WPC are established.
6) Communities participate and contribute to O/M for the project.
7) Sanitation and hygiene condition is assessed severe.
8) There is no apparent obstruction to land acquisition.
9) Possibility of money raising by the water committee satisfies to cover O/M cost for water supply facilities.
10) The people are ready to contribute.

Others

11) There is no project by other donors overlapping in the project villages.
12) The project cost efficiency is justifiable.

Annex-IV

Flow Chart of Screening and Selection of the Villages



JAPAN'S GRANT AID SCHEME

1. Grant Aid Procedures

(1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

(2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.

Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

(1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

1) Confirmation of the background, objectives, and benefits of the requested project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.

2) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economical point of view.

3) Confirmation of items agreed on by both parties concerning the basic concept of the Project.

4) Preparation of a basic design of the Project.

5) Estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.

The consulting firm(s) used for the Study is (are) recommended by JICA to the recipient country to also work in the Project's implementation after the Exchange of Notes, in order to maintain technical consistency.

3. Japan's Grant Aid Scheme

(1) Grant Aid

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

(2) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc. are confirmed.

(3) "The period of the Grant Aid" means the one fiscal year which the Cabinet

approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and a final payment to them must be completed.

However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year by mutual agreement between the two Governments.

(4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(5) Necessity of "Verification"

The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(6) Undertakings required of the Government of the Recipient Country

In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

1) To secure land necessary for the sites of the Project, and to clear, level and reclaim the land prior to commencement of the construction.

2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.

3) To secure buildings prior to the procurement in case the installation of the equipment.

4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.

5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.

6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into

the recipient country and stay therein for the performance of their work.

7) Proper Use
The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

8) Re-export
The products purchased under the Grant Aid should not be re-exported from the recipient country.

9) Banking Arrangement (B/A)
(a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the verified contracts.

(b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

Annex-VI

MAJOR UNDERTAKING TO BE TAKEN BY EACH GOVERNMENT

No.	Items	To be covered by Grant A/D	To be covered by Recipient
1	To secure land		●
2	To clear, level and reclaim the site when needed		●
3	To construct gates and fences in and around the site when needed		●
4	To construct the parking lot	●	
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct the buildings	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distribution line to the site		●
	b. The drop wiring and internal wiring within the site	●	
	c. The main circuit breaker and transformer	●	
	2) Water supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tank)	●	
	3) Drainage		
	a. The city drainage main (for storm, sewer and others)to the site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gus supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone system		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panal	●	
	6) Furniture and equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the following commissions to the Japanese bank for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
9	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	●
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts		●
12	To maintain and use properly and effectively the equipment and materials provided under the Grant		●
13	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment		●

MINUTES OF DISCUSSIONS
ON
THE BASIC DESIGN STUDY ON
THE RURAL WATER SUPPLY PROJECT IN LINDI AND MTWARA REGIONS
IN THE UNITED REPUBLIC OF TANZANIA
(EXPLANATION ON DRAFT FINAL REPORT)

In November 2002, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Rural Water Supply Project in Lindi and Mtwara Regions in the United Republic of Tanzania (hereinafter referred to as "the Project") and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult with the Government of the United Republic of Tanzania on the components of the draft report, JICA sent to Tanzania the Draft Final Report Explanation Team (hereinafter referred to as "the Team"), headed by Mr. Hiroyuki Kinomoto, Deputy Resident Representative, Tanzania Office, JICA, from April 24 to April 30, 2003.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Dar es Salaam, April 30, 2003

Mr. Hiroyuki Kinomoto
Leader
Basic Design Study Team
Japan International Cooperation Agency

For PERMANENT SECRETARY
MINISTRY OF WATER AND
LIVESTOCK DEVELOPMEN

Mr. Christopher N. Sayi
for the Permanent Secretary,
Ministry of Water and Livestock Development
The United Republic of Tanzania

Witness

Mr. Paul A. Mwafango
Assistant Commissioner, Bilateral Cooperation,
Ministry of Finance
The United Republic of Tanzania

ATTACHMENT

1. Components of the Draft Final Report

The Tanzanian side agreed and accepted in principle the components of the draft final report as explained by the Team. After discussions with the Team, the Tanzanian side finally confirmed the items and components which will be procured and constructed under the Project described in **Annex-I and Annex -II**. However, the following issues were requested by the Tanzanian side:

- The Tanzanian side requested to add the magnetic survey equipment into the equipment list and to include water level meter in the well-testing equipment.
- The Tanzanian side explained the necessity of nine (9) 4WD vehicles for each district because of the poor road conditions.
- The Tanzanian side explained that the water yield of the existing borehole in Kilangala Village in Lindi Region has decreased and it is necessary to drill a new borehole.
- The Tanzanian side explained the need for additional permanent storage tanks in Kilangala and Ziwani villages.

2. Japan's Grant Aid scheme

The Tanzania side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Tanzania as explained by the Team and described in **Annex-V** and **Annex-VI** of the Minutes of Discussions signed by both parties on November 27, 2002.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to Tanzania by July 2003.

4. Other relevant issues

(1) The Team explained the criteria for screening of the requested villages as follows;

Ground water level (Static water level) : up to 60 m (hand pump) / 150 m(motorized pump)

Water yield : more than 5 l/min.(hand pump) / 20 l/min.(motorized pump)

Water quality : Tanzania water quality standard

Both sides agreed to construct water supply facilities in 64 villages after screening of the 100 requested villages.

(2) The Team decided the type of water supply facilities for each village based on the ground water level, population and willingness to pay of the villagers for the O/M cost.

The Tanzanian side confirmed the result as follows;

Level I: 26villages

Level II: 38villages

(3) Operation and Maintenance (O/M)

- Ministry of Water and Livestock Development and Regional Water Engineers should be responsible for the technical backstopping for the district councils' activities and O/M of the equipments procured under the Project.
- District Water Engineers should be responsible for O/M of the water supply facilities constructed under the Project.
- Village Water Committees and Water Point Committees which have been established should be strengthened.
- The beneficiaries should be responsible for paying for their water supply services.

(4) The Tanzanian side requested the consultant services as "soft component" to be included in the Project, in order to secure sustainable hygiene education and O/M activities after completion of the Project. The following soft components shall be executed under the Project;

- Awareness enlightenment for resident's participation
- Planning of O/M and technical training
- Monitoring and evaluation
- Hygiene education

(5) The Team explained that detailed geophysical surveys shall be conducted in the villages during detailed design stage instead of exploratory drilling, in order to assure successful boreholes.

(6) The Tanzanian side expressed the importance of the monitoring of the water levels in the boreholes. The consultant will consider the method to be used for that purpose during the detailed design stage.

ANNEX I

Results of Final Screening

Region	District	
Mtwara		
	Mtwara Rural	16
	Tandahimba	5
	Newala	2
	Masasi	8
Mtwara Total		31
Lindi		
	Kilwa	3
	Lindi	13
	Ruangwa	8
	Nachingwea	5
	Liwale	4
Lindi Total		33
Grand Total		64

ANNEX II

List of Equipment

Division	Equipment	Purpose/Items	Qty	Remarks
A. Drilling Equipment	Spare parts for FSW-7T-L37	Spare parts of drilling rig, vehicles and compressor provided in 1997. Used for maintenance.	1 set	
	Drilling machine	Truck mount rotary in combination with DTH, drilling capability 200m at 6-12 inches.	1 set	
	Supporting equipment and vehicles	Hammer, bit, tools, compressor, cargo truck, water tank lorry, fuel truck. Utilized for drilling and transportation of equipment and materials.	1 set	One set each
	Well testing equipment	Well logging, motor pump, generator, notch for pumping test. Utilized for judgement of aquifer parameters and possible pumping discharge	2set each	Well logging 1 set
	Geophysical survey equipment	Resistivity survey equipment. With 12V24A Batteries, cables and poles	2 set	ditto
B. O&M Equipment	Small size truck with crane	Repair and maintenance	2 set	One set for each RWE
	Welder	Welding of pipes	2 set	ditto
	Maintenance tool	Repair tool kit	2 set	ditto
	Motorbike	Routine check and technical guidance	9 set	One set for each DWE
	Well cleaning equipment	Compressor, cargo truck Utilized for well cleaning.	2 set	One set for each RWE
C. Survey Equipment	Water quality meter	Portable pH, ORP, EC meters	2 set	ditto
	Pickup truck	Transportation of equipment	2 set	ditto
	Computer with accessories	Desktop, printer and software	2 set	ditto
	Current meter	For stream flow measurement	2 set	ditto
	Land survey equipment	Total station system	2 set	ditto

5. *Other Relevant Data*

5-1. Results of Water Quality Analysis in the Target Area

RESULT OF FIELD GROUNDWATER SAMPLING (1/3)

JICA_ID	Region	District	Village_Name	Survey Date	Type of Source	Source UTM-E (m) [WGS84]	Source UTM-N (m) [WGS84]	Source LAT (deg) [WGS84]	Source LON (deg) [WGS84]	Source Elev (m) [GPS]	GPS Remarks	EC (mS/m)	Temp (deg)	ORP (mV)	pH	DTW (m below GL)	Well Depth (m)	Sample No.	Sampled? (Yes=1)	POP	Water Source (2002)
1	Mtwara	Mtwara	Mbembaleo	2003/2/1	TDW	598660	8815920	-10.7103	39.90194	137.5	—	16.42	27.0	23	6.13	5.25	5.25	1	1	6110	
2	Mtwara	Mtwara	Maranje	2003/2/1	RW	610764	8831493	-10.5689	40.0125	171.5	—	11.73	27.2	56	6.17	2.45	2.45	2	1	2346	RW (1975) (3km); Four RW in place; Used by four other villages.
3	Mtwara	Mtwara	Mtiniko	2003/2/1	RW	604516	8830642	-10.5769	39.95528	135.0	—	54.3	27.9	-11	6.83	2.6	2.6	3	1	1564	RW (3km)
4	Mtwara	Mtwara	Malamba	2003/2/1	RW	610764	8831493	-10.5689	40.0125	171.5	—	11.73	27.2	56	6.17	2.45	2.45	4	1	1219	RW (1975) (14km); from neighboring Maranje village.
5	Mtwara	Mtwara	Ziwani	2002/5/12	BH(JM-1)	636423	8856279	-10.3442	40.24611	69.5	—	112.0	28.1	156	7.34	(40.8)	64.07	05	1	6700	BH (2000) (500m) ; Dam (500m)
6	Mtwara	Mtwara	Msimbati	2003/2/1	RW	656762	8856765	-10.3389	40.43167	10.5	—	49.8	30.5	-15	7.26	—	6.05	6	1	4279	RW with HP (1936) (Rehabilitated 1994) (630m)
(6II)	Mtwara	Mtwara	Msimbati	2003/7/1	RW	629802	8866262	-10.2539	40.18528	8.0	—	73.9	29.2	94	7.20	—	4.65	6II	1		RW (1979) (700m)
(6III)	Mtwara	Mtwara	Msimbati	2003/7/1	RW	656834	8856125	-10.3447	40.4325	—	—	86.0	30.7	18	7.91	—	4.55	6III	1		RW (HP) (1979) (500m)
(6IV)	Mtwara	Mtwara	Msimbati	2003/7/1	RW	656617	8856156	-10.3444	40.43056	11.0	—	622.0	28.7	10	7.33	—	5.05	6IV	1		RW (1979) (400m)
(6V)	Mtwara	Mtwara	Msimbati	2003/7/1	RW	656555	8856280	-10.3433	40.43	20.0	—	85.8	29.9	5	7.86	—	4.9	6V	1		RW (1979) (600m)
7	Mtwara	Mtwara	Msangamkuu	2003/2/1	RW	635227	8867352	-10.2439	40.23472	1.0	—	26.6	27.7	135	7.26	1.5	5.0	7	1	4980	RW (1977) (2.4km); Formerly was source for pumping scheme.
(7II)	Mtwara	Mtwara	Msangamkuu	2003/7/1	RW	635086	8868468	-10.2339	40.23333	10.0	—	66.7	29.9	74	7.21	2.1	3.4	7II	1		RW (1km)
(7III)	Mtwara	Mtwara	Msangamkuu	2003/7/1	Tube Well with HP	633859	8867072	-10.2467	40.22222	—	—	318.0	30.0	83	7.00	3.0	8.8	7III	1		Tube Well with HP (2.5km)
(7IV)	Mtwara	Mtwara	Msangamkuu	2003/7/1	Tube Well with HP	635341	8866559	-10.2511	40.23583	16.0	—	15.05	29.9	85	7.60	5.1	10.0	7IV	1		Tube Well with HP (2.5km)
8	Mtwara	Mtwara	Nanguruwe	2003/2/1	RW	613180	8839282	-10.4989	40.03417	172.0	—	23.1	27.5	86	6.56	1.1	1.1	8	1	5725	RW (500m) ; Dam (800m)
9	Mtwara	Mtwara	Mbawala	2003/1/2	RW	621587	8844538	-10.4508	40.11083	146.0	—	19.62	27.9	123	6.06	1.5	4.0	9	1	6000	RW (HP) (250m)
10	Mtwara	Mtwara	Kawawa	2003/6/1	RW	620033	8854730	-10.3586	40.09639	70.0	—	19.40	24.9	152	5.98	—	2	10	1	3530	RW (2001) (1km) ; Dam(1.5km)
11	Mtwara	Mtwara	Kitaya	2003/2/1	TDW	629843	8824103	-10.6353	40.18694	19.0	—	16.13	30.6	-7	6.96	2.9	3	11	1	5010	TDW ; Ruvuma River (500m)
12	Mtwara	Mtwara	Arusha Chini	2003/2/1	BH	624793	8827634	-10.6036	40.14083	38.5	—	65.1	28.5	179	7.78	—	60.0	12	1	876	BH (2000) (400m)
13	Mtwara	Mtwara	Mayembe Juu	2003/2/1	TDW	619897	8820519	-10.6681	40.09611	93.5	—	27.3	29.1	35	6.48	2	2	13	1	950	TDW (1km) ; Ruvuma River (8km)
14	Mtwara	Mtwara	Kitumguli	31/12/2002	RW	640542	8834945	-10.5369	40.28444	15.5	—	81.2	27.7	174	7.22	0.5	3.6	14	1	1568	RW (1977) (800m)
15	Mtwara	Mtwara	Mahurunga	31/12/2002	RW	639453	8833692	-10.5481	40.27444	13.5	—	81.4	27.2	167	7.29	1.5	5	15	1	1522	RW (1977) (700m)
16	Mtwara	Mtwara	Dihimba	31/12/2002	BH	606989	8849133	-10.4097	39.9775	70.5	—	97.4	28.0	135	6.72	—	82.5	16	1	1385	BH (1978); Tap Water 10TSH/20l.
17	Mtwara	Mtwara	Mpondomo	31/12/2002	(No GW Source)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2178	BH; Tap Water 10TSH/20l From neighboring Dihimba village.
	Mtwara	Mtwara	Mbae	2003/6/1	BH	626357	8860227	-10.3086	40.15389	23.0		80.5	28.1	73	6.95	—	—	Mbae	1	—	BH; Tap Water (1km)
18	Mtwara	Tandahimba	Mihambwe	2003/4/1	(No GW Source)	587489	8803497	-10.8228	39.80028	—	VO	—	—	—	—	—	—	—	—	6217	Ruvuma river (8-10 km); Some RWH.
19	Mtwara	Tandahimba	Kitama	2003/4/1	TDW	578944	8813416	-10.7333	39.72194	230.0	VO	10.72	27.9	16	6.03	3.4	3.4	19	1	6198	TDW (2km)
20	Mtwara	Tandahimba	Mitondi A	2003/4/1	TDW	578739	8817363	-10.6978	39.72	252.5	—	20.2	29.4	8	5.90	—	2	20	1	733	TDW(2km)
21	Mtwara	Tandahimba	Misutini	2003/4/1	(No GW Source)	584049	8801008	-10.8453	39.76889	246.0	VO	—	—	—	—	—	—	—	—	1300	Ruvuma river (8km); Some RWH.
22	Mtwara	Tandahimba	Litehu	2003/4/1	TDW	556171	8838114	-10.5103	39.51333	339.0	—	7.5	26.9	224	5.30	3.15	3.15	22	1	1972	TDW (1.5km)
23	Mtwara	Tandahimba	Mmeda	2003/4/1	TDW	553271	8838954	-10.5028	39.48694	341.0	—	13.32	25.9	159	5.95	—	0	23	1	1500	TDW (300m)
24	Mtwara	Tandahimba	Mabeti	2003/4/1	TDW	552786	8844083	-10.4564	39.48222	352.0	—	14.26	26.3	163	6.21	—	0	24	1	989	TDW (2.5km)
25	Mtwara	Tandahimba	Mkwiti Chini	2003/4/1	SP	536443	8852826	-10.3775	39.33278	203.5	—	74.0	29.4	187	7.24	—	—	25	1	1154	Spring (5.5km)
26	Mtwara	Tandahimba	Namindondi Juu	2002/6/12	SP	549308	8849519	-10.4072	39.45056	331.0	—	106.5	26.3	93	7.65	0	—	26	1	2042	Spring (1.6km) ; Very low yield.
26(II)	Mtwara	Tandahimba	Likolombe Chini	2002/6/12	RW with HP	546552	8854730	-10.3603	39.42528	171.0	—	128.5	27.9	-36	7.81	—	—	26B	1		RW (HP)
27	Mtwara	Tandahimba	Nanjanga	2003/5/1	(No GW Source)	541482	8841424	-10.4806	39.37917	602.5	VC	—	—	—	—	—	—	—	—	611	3km to Mangombya ; Some RWH
28	Mtwara	Tandahimba	Mkuti	2003/1/5	(No GW Source)	542242	8836647	-10.5239	39.38611	554.0	VC	—	—	—	—	—	—	—	—	760	5km to Chikuti
29	Mtwara	Newala	Mnanje	2003/1/3	(No GW Source)	533740	8785700	-10.9847	39.30889	623.0	VO	—	—	—	—	—	—	—	—	995	TDW (5km)
30	Mtwara	Newala	Kilidu	2003/3/1	(No GW Source)	533732	8804846	-10.8114	39.30861	641.0	VC	—	—	—	—	—	—	—	—	745	River (12km)
31	Mtwara	Newala	Mnima	2003/4/1	SP	510805	8821333	-10.6625	39.09889	603.0	—	11.92	24.8	262	4.53	—	—	31	1	2700	Spring (3km)
32	Mtwara	Newala	Miyuyu	2002/7/12	SP	507969	8833885	-10.5489	39.07278	893.0	—	6.2	21.8	76	8.60	0	0	Y-Sp-32	1	857	Spring (2.5km)
33	Mtwara	Newala	Namangudu	2003/4/1	(No GW Source)	528458	8838092	-10.5108	39.26	715.5	VC	—	—	—	—	—	—	—	—	783	Spring (9km) ; Some RWH.
34	Mtwara	Newala	Mitanga	2003/3/1	(No GW Source)	538086	8829111	-10.5919	39.34806	—	VO	—	—	—	—	—	—	—	—	1271	2km to Maputi ; Some RWH.
35	Mtwara	Newala	Likwaya	2003/3/1	(No GW Source)	535289	8828999	-10.5931	39.3225	—	VO	—	—	—	—	—	—	—	—	507	3km to Maputi ; Some RWH.
36	Mtwara	Newala	Malatu Juu	2003/3/1	(No GW Source)	528316	8809551	-10.7689	39.25889	646.0	VO	—	—	—	—	—	—	—	—	2408	TDW (7km) ; Mkunjo Spring (15km)

RESULT OF FIELD GROUNDWATER SAMPLING (2/3)

JICA_ID	Region	District	Village_Name	Survey Date	Type of Source	Source UTM-E (m) [WGS84]	Source UTM-N (m) [WGS84]	Source LAT (deg) [WGS84]	Source LON (deg) [WGS84]	Source Elev (m) [GPS]	GPS Remarks	EC (mS/m)	Temp (deg)	ORP (mV)	pH	DTW (m below GL)	Well Depth (m)	Sample No.	Sampled? (Yes=1)	POP	Water Source (2002)
37	Mtwara	Newala	Mdimba	2003/3/1	(No GW Source)	532139	8808766	-10.7761	39.29389	625.0	VO	—	—	—	—	—	—	—	—	1360	4.5km to Kitangari Scheme ; Some RWH
38	Mtwara	Newala	Chiwonga	2003/3/1	(No GW Source)	537073	8833991	-10.5478	39.33889	631.0	VC	—	—	—	—	—	—	—	—	1786	9km to Maputi ; Some RWH
39	Mtwara	Newala	Mmulunga	2003/3/1	(No GW Source)	540685	8830931	-10.5756	39.37194	—	VC	—	—	—	—	—	—	—	—	2152	8km to Maputi ; Some RWH ; Chaume dam in Tandahimba.
39(I)	Mtwara	Newala	Kitangari	27/12/2002	BH(Well-6)	530616	8820410	-10.6708	39.28	383.0	—	23.8	26.9	77	4.68	—	120	KTG	1		
39(II)	Mtwara	Newala	Kitangari	27/12/2002	Treated Water	530616	8820410	-10.6708	39.28	383.0	—	22.4	27.4	53	4.65	—	120	KTG-AT	1		
39(III)	Mtwara	Newala	Mkunya	27/12/2002	SP	543456	8782661	-11.0119	39.39778	100.0	—	34.7	27.4	126	8.30	0	—	MKN-SP	1		
40	Mtwara	Masasi	Nanganga	31/12/2002	RW	519238	8849706	-10.4058	39.17583	220.0	—	16.8	28.2	17	7.30	5.5	5.5	40	1	2265	RW (1991) (2km)
41	Mtwara	Masasi	Namkungwi	31/12/2002	BH	468869	8812438	-10.7428	38.71528	406.5	—	312.0	27.9	157	6.93	—	80	41	1	1318	BH (2002) ; TDW
42	Mtwara	Masasi	Kilosa	26/12/2002	TDW	460957	8803608	-10.8228	38.64278	329.0	—	10.53	28.3	-40	7.35	1.3	1.5	42	1	2500	TDW (1.3km) ; Four (4) Springs.
43	Mtwara	Masasi	Chikoweti	30/12/2002	BH	462351	8820776	—	—	423.5	—	312.0	27.7	105	6.95	—	70.5	43	1	3218	BH (1975) ; TDW
44	Mtwara	Masasi	Mlingula	30/12/2002	TDW	465654	8812445	—	—	414.0	—	9.34	26.1	110	6.85	3.5	3.5	44	1	2511	TDW (1km); RW (1985)
45	Mtwara	Masasi	Chiwale	30/12/2002	TDW	459751	8828253	—	—	439.5	—	9.95	28.4	161	6.40	3.5	3.5	45	1	5159	TDW (1.5km)
46	Mtwara	Masasi	Nanyumbu	2002/12/12	BH(JM-5)	443946	8767256	-11.1511	38.48667	274.7	—	130.6	28.9	-12	6.82	(4.76)	80	46	1	3400	BH (2000) (0.23km)
47	Mtwara	Masasi	Namasogo	26/12/2002	SP	439655	8777242	-11.0608	38.4475	330.5	—	11.53	31.2	11	7.35	—	—	47	1	1432	Spring during rainy season only; TDW(5km)
48	Mtwara	Masasi	Msanga	30/12/2002	TDW	520113	8798273	-10.8711	39.18417	455.5	—	22.1	28.6	121	6.58	2.3	2.3	48	1	1057	TDW (1.6km)
49	Mtwara	Masasi	Mpeta	30/12/2002	RW	494146	8799499	-10.86	38.94639	251.0	—	15.86	28.0	25	6.54	1.2	—	49	1	2185	RW (1.5km)
50	Mtwara	Masasi	Mitonji	30/12/2002	BH	502279	8788603	-10.9586	39.02083	243.5	—	271.0	28.6	-73	6.62	(64-68)	70.0	50	1	1071	BH (HP) (1988) (1.5km) ; TDW(1km)
51	Lindi	Kilwa	Migeregere	2002/12/12	BH	525358	9025225	-8.81833	39.23056	116.7	—	—	—	—	—	(73.2)		(No Sample)		1400	Nakurukuru (tap,15km)
52	Lindi	Kilwa	Mtandango	2002/12/12	TDW	528431	9055703	-8.5425	39.25833	42.0	—	3.1	36.1	135	8.42	3.3	5.5	52	1	909	TDW(1km)
53	Lindi	Kilwa	Somago Ndumbo	2002/12/12	RW with HP	531451	9072274	-8.39278	39.28556	18.5	—	266.0	27.7	-69	6.36	4.5	4.5	53	1	3800	RW (10 number.) ; TDW (6 nos)
54	Lindi	Kilwa	Pande Plot	2002/11/12	BH(JL-3)	561729	8990149	-9.13472	39.56194	39.0	—	616.0	29.0	179	6.37	(28)	71.9	54	1	3600	BH (2000) ; TDW (500m)
55	Lindi	Kilwa	Mtitimira	2002/11/12	TDW	561766	8986211	-9.17083	39.56222	68.5	—	14.5	28.0	109	7.03	5.8	7	55	1	610	TDW (500m)
56	Lindi	Kilwa	Lihimalyao	2002/11/12	TDW	568767	8969021	-9.32611	39.62611	38.0	—	18.6	28.9	177	7.19	5.3	5.3	56	1	4325	Cave (5km) ; TDW (during rainy season)
57	Lindi	Kilwa	Namakongoro	2002/11/12	TDW	567355	8974154	-9.27972	39.61333	52.3	—	43.5	29.0	182	7.08	6.65	7	57	1	2800	TDW
58	Lindi	Kilwa	Mandawa	2002/12/12	SP	547826	8964099	-9.37111	39.43556	38.0	—	113.4	27.4	120	6.82	—	—	58	1	3408	Spring (500m)
59	Lindi	Kilwa	Kiwawa	2002/12/12	TDW	539791	8984742	-9.18444	39.36222	115.0	—	149.3	28.3	113	7.00	Shallow	Shallow	59	1	1800	TDW (200m)
(59B)	Lindi	Kilwa	Nangurukuou	2002/12/12	SP	542565	9029648	-8.77806	39.38694	119.5	—	127.1	30.8	50	6.27	—	—	59B	1		Spring; (Intake location is 10km from village's storage tank)
	Lindi	Kilwa	Njianne	2002/12/12	BH (by RIPS)	528258	9060182	-8.50222	39.25667	43.0	—	1000<	—	—	—	—	51	(No Sample)			Proposed source for Njianne village.
60	Lindi	Lindi	Chiwerere	2003/5/1	SP	520822	8853960	-10.3675	39.19028	211.0	—	153.6	30.1	153	7.90	—	—	60	1	1438	Stream (500m)
61	Lindi	Lindi	Nyengedi	14/12/2002	RW	547093	8866887	-10.2503	39.43	127.5	—	41.1	28.4	-84	6.76	6	7	61	1	3812	RW(500m) ; Stream (500m)
(61II)	Lindi	Lindi	Nyengedi	14/12/2002	Tube Well with HP	547979	8865172	-10.2658	39.43806	109.0	—	38.1	27.5	-67	6.84	7.0	9.8	61II	1		Tube Well (HP) (2002); Serves one subvillage.
62	Lindi	Lindi	Mtumbya	14/12/2002	TDW	552280	8859808	-10.3142	39.4775	205.0	—	102.5	33.5	24	6.06	1	1.5	62	1	2701	TDW (400m) ; River (12km)
63	Lindi	Lindi	Kilimahewa(Muta)	2002/9/12	SP	550725	8869389	-10.2275	39.46306	91.0	—	16.7	29.0	109	7.60	0		63	1	1923	Spring (1km)
64	Lindi	Lindi	Madangwa	2002/9/12	SP	595857	8869652	-10.2244	39.87528	72.0	—	171.0	27.2	118	6.98	0		64Sp	1	2468	Spring (2km)
65	Lindi	Lindi	Hingewali	2003/5/1	DW	587850	8872732	-10.1967	39.80194	244.5	—	119.5	—	—	6.38	1.5	1.5	65	1	4952	DW (1km)
66	Lindi	Lindi	Madingo	14/12/2002	Stream Water	572953	8849227	-10.4094	39.66667	125.0	—	134.1	25.5	144	8.35	—	—	66	1	3085	Stream (4.5km)
67	Lindi	Lindi	Chiuta	14/12/2002	SP	567931	8840115	-10.4919	39.62083	273.5	—	46.6	26.2	193	7.75	—	—	67	1	2335	Spring (3.5km)
68	Lindi	Lindi	Malungo	14/12/2002	TDW	573817	8831839	-10.5667	39.67472	295.5	—	104.6	34.1	89	7.48	0.8	1.5	68	1	2161	TDW (0.7km)
69	Lindi	Lindi	Kiwalala	14/12/2002	RW	559492	8873577	-10.1894	39.54333	52.0	—	10.5	27.5	123	5.84	0.5	1	69	1	4981	RW (1989) (1km) ; Spring (1km)
70	Lindi	Lindi	Mnolera	2002/5/1	RW	581627	8868792	-10.2325	39.67861	137.5	—	152.4	26.1	112	6.81	2	2	70	1	1894	RW (1.5km)
70(II)	Lindi	Lindi	Mnolera	2002/5/1	TDW	580682	8869177	-10.2292	39.73667	161.0	—	39.9	27.7	132	6.63	4.0	4.2	70 II	1		TDW (1km)
71	Lindi	Lindi	Chiodya	2002/9/12	SP	545471	8878596	-10.1444	39.415	458.0	—	19.9	26.1	174	6.54	0		71B-Sp	1	3425	Spring (5km)
72	Lindi	Lindi	Kinengene	14/12/2002	BH	562940	8901491	-9.93694	39.57417	114.0	—	58.8	28.1	-27	8.76	3.7	56.0	72	1	7680	BH (1976) (5km)
(72-b)	Lindi	Lindi	Kinengene	14/12/2002	RW	568721	8897455	-9.97333	39.62694	55.5	—	119.7	27.2	6	7.43	6	6	72-b	1		RW (1964) (500m)
73	Lindi	Lindi	Kilangala	13/12/2002	BH(JL-2)	564037	8924684	-9.72722	39.58889	104.0	—	60.2	30.5	69	7.88	(Artesian)	94.5	73	1	8660	BH (2000)

RESULT OF FIELD GROUNDWATER SAMPLING (3/3)

JICA_ID	Region	District	Village_Name	Survey Date	Type of Source	Source UTM-E (m) [WGS84]	Source UTM-N (m) [WGS84]	Source LAT (deg) [WGS84]	Source LON (deg) [WGS84]	Source Elev (m) [GPS]	GPS Remarks	EC (mS/m)	Temp (deg)	ORP (mV)	pH	DTW (m below GL)	Well Depth (m)	Sample No.	Sampled? (Yes=1)	POP	Water Source (2002)
74	Lindi	Lindi	Kilolombwani	13/12/2002	BH	574940	8936054	-9.62417	39.68306	71.0	—	416.0	30.8	74	7.68	—	76	74	1	1100	BH (2000) (500m) ; TDW; River (6km)
75	Lindi	Lindi	Lihimilo	13/12/2002	TDW	552440	8928263	-9.695	39.47806	140.0	—	218.0	25.1	0	6.84	0	0	75	1	1158	TDW (1.5km) ;River (3km)
76	Lindi	Lindi	Chikonji	14/12/2002	Tube Well	562935	8901569	-9.86972	39.57417	111.5	—	48.9	28.5	-8	8.86	0.0	70.0	76	1	2391	Tube Well (1999) (2.2km)
77	Lindi	Ruangwa	Nanganga	19/12/2002	RW	516348	8850774	-10.3964	39.14972	204.0	—	194.9	27.7	70	7.33	3.35	4	77	1	1121	RW (1979) (1km) ; River (2km)
78	Lindi	Ruangwa	Chilangalile	19/12/2002	(No Source)	VO(483742)	VO(8876680)	-10.16194444	38.85166667	VO(364)	—	—	—	—	—	—	—	(No Sample)		966	Stream (5km)
79	Lindi	Ruangwa	Machanganja	19/12/2002	TDW	478941	8899888	-9.95194	38.80778	254.0	—	61.8	28.0	-32	8.21	3	3	79	1	1905	TDW(700m)
80	Lindi	Ruangwa	Liuguru	19/12/2002	TDW	487857	8890839	-10.0339	38.88917	310.5	—	9.9	25.8	56	8.28	2.3	2.5	80	1	1689	TDW(1km)
81	Lindi	Ruangwa	Mihewe	19/12/2002	RW	486419	8901353	-9.93889	38.87611	250.5	—	226.0	27.4	145	8.02	1	6	81	1	1060	RW (1985) (1.5km)
82	Lindi	Ruangwa	Chinongwe	19/12/2002	BH with HP (JL-5)	490334	8841479	-10.4803	38.91167	305.5	—	137.8	28.1	58	6.49	(6.80)	62	82	1	4239	BH (2000) (1.5km)
83	Lindi	Ruangwa	Litama	19/12/2002	TDW	489335	8839918	-10.4944	38.9025	302.0	—	13.5	29.2	28	6.85	4	4	83	1	1270	TDW (500) ; River (4km)
84	Lindi	Ruangwa	Likwachu	19/12/2002	RW	496054	8841746	-10.4781	38.96389	268.0	—	15.0	28.8	134	5.98	—	—	84	1	4356	RW (1992) (1km) ; 8km to Mwena Scheme.
85	Lindi	Ruangwa	Ipingo	19/12/2002	DW	502241	8849666	-10.4064	39.02056	292.5	—	14.0	27.5	44	7.70	5.15	6	85	1	1040	DW (1997) (500m)
86	Lindi	Ruangwa	Chibula	19/12/2002	TDW	503941	8902631	-9.92722	39.03583	324.5	—	132.0	27.2	-25	8.17	4	4	86	1	1192	TDW (1.6km)
87	Lindi	Nachingwea	Mkonjela	18/12/2002	TDW	458853	8861704	-10.2972	38.62417	415.0	—	6.3	28.9	73	6.45	1.5	1.5	87	1	3665	TDW (2000) ; (5km to Ntila HP)
88	Lindi	Nachingwea	Litula	18/12/2002	RW	477025	8870859	-10.2144	38.79028	401.0	—	128.5	27.1	60	6.68	—	16	88	1	1793	RW (1958) (1km) ; TDW(200m)
89	Lindi	Nachingwea	Rweje	18/12/2002	BH with HP	474891	8879884	-10.1328	38.77111	379.0	—	506.0	28.1	19	7.03	—	140.8	89	1	1352	BH (1979) (1km)
90	Lindi	Nachingwea	Naipanga	18/12/2002	TDW	481068	8839333	-10.4997	38.82694	351.0	—	64.2	28.7	133	7.89	1	1	90	1	13449	TDW (1.5 km)
91	Lindi	Nachingwea	Chiumbati Miembe	20/12/2002	TDW	478194	8849952	-10.4036	38.80083	375.0	—	151.2	28.3	12	5.77	4	4	91	1	973	TDW (2km) ; TDW(6.5km)
92	Lindi	Nachingwea	Mandai	20/12/2002	TDW	478456	8857037	-10.3394	38.80333	—	—	33.4	28.9	18	6.25	4	4	92	1	1980	TDW (5km)
93	Lindi	Nachingwea	Ndomoni	18/12/2002	RW	480895	8834576	-10.5428	38.82528	313.0	—	35.8	26.8	41	7.90	5.62	5.62	93	1	1290	RW (1964) (2km)
94	Lindi	Nachingwea	Kipara Mtua	20/12/2002	TDW	452576	8853691	-10.3697	38.56667	432.0	—	19.1	27.4	-6	7.75	4	4	94	1	2154	TDW (1.5km)
95	Lindi	Nachingwea	Mpiruka	18/12/2002	RW	382207	8915940	-9.80528	37.92583	499.5	—	4.6	27.5	100	5.90	1.6	2	95	1	2721	RW (1972) (2km)
96	Lindi	Liwale	Mlembwe	17/12/2002	TDW	345857	8930190	-9.675	37.595	691.5	—	8.0	26.4	161	7.04	0.5	1.2	96	1	1565	TDW (500m)
97	Lindi	Liwale	Mikunya	17/12/2002	RW	399001	8917312	-9.79333	38.07917	434.5	—	10.2	28.7	72	6.23	2.23	3	97	1	1182	RW (1981) (1km)
98	Lindi	Liwale	Mihumo	17/12/2002	TDW	380252	8900963	-9.94056	37.9075	509.0	—	4.9	32.2	45	6.45	2.5	2.5	98	1	2456	TDW (500m) ; Stream(1km)
99	Lindi	Liwale	Mbaya	17/12/2002	TDW	385176	8931335	-9.66611	37.95333	434.5	—	6.5	38.1	96	7.15	3.5	3.5	99	1	1945	TDW (1km) ; Stream(1km)
100	Lindi	Liwale	Ngongowele	17/12/2002	TDW	367620	8883910	-10.0944	37.79194	558.5	—	12.9	28.1	45	6.78	1.5	1.5	100	1	1853	TDW (2km) ; Stream(4km)

BH: Bore Hole, RW: Ring Well, DW: Dug Well, TDW: Traditional Dug Well, SP: Spring, HP: Hand Pump, VO: Village C, (1959) -Year of Construction 100

RESULT OF GROUNDWATER QUALITY ANALYSIS (1/3)

JICA_ID	Region	District	Division	Ward	Village_Name	Result of Field Measurement														Laboratory analysis Results									
						Sampling Date	Type of Source	Source UTM-E (m)	Source UTM-N (m)	Source LAT (deg)	Source LON (deg)	Source Elev (m)	EC (mS/m)	Temp (deg)	ORP (mV)	pH	DTW (m below GL)	Well Depth (m)	Sample No.	Calcium Ca (mg/l)	Magnesium Mg (mg/l)	Sodium Na (mg/l)	Potassium K (mg/l)	Sulfate SO_4 (mg/l)	Chloride Cl (mg/l)	Bicarbonate HCO_3 (mg/l)	Total Iron Fe (mg/l)	Fluoride F (mg/l)	Manganese Mn (mg/l)
Tanzanian Standard																				n.m	n.m	n.m		600.00	800.0		1.0	8.0	1.5
WHO Guideline																				n.m	n.m	200		250.00	250.0		0.3	1.5	0.5
1	Mtwara	Mtwara	Nanyamba	Nanyamba	Mbembaleo	2003/2/1	TDW	598660	8815920	-10.7103	39.90194	137.5	16.4	27.0	23	6.13	5.25	5.25	1	6.80	1.36	16.63	19.50	62.50	27.50	46.00	2.60	0.00	0.00
2	Mtwara	Mtwara	Nanyamba	Mtiniko	Maranje	2003/2/1	RW	610764	8831493	-10.5689	40.0125	171.5	11.73	27.2	56	6.17	2.45	2.45	2	1.20	2.10	16.20	12.00	37.50	28	32.00	1.74	0.00	0.10
3	Mtwara	Mtwara	Nanyamba	Mtiniko	Mtiniko	2003/2/1	RW	604516	8830642	-10.5769	39.95528	135.0	54.3	27.9	-11	6.83	2.6	2.6	3	0.60	4.90	57.14	14.40	0.00	185.00	121.00	0.12	0.20	0.00
4	Mtwara	Mtwara	Nanyamba	Mtiniko	Malamba	2003/2/1	RW	610764	8831493	-10.5689	40.0125	171.5	11.73	27.2	56	6.17	2.45	2.45	4	0.45	4.10	16.42	7.50	0.00	40.00	36.00	2.18	0.00	0.00
5	Mtwara	Mtwara	Ziwani	Ziwani	Ziwani	2002/5/12	BH(JM-1)	636423	8856279	-10.3442	40.24611	69.5	112.0	28.1	156	7.34	(40.8)	64.07	5	0.36	0.05	137.11	7.90	40.00	312.00	52.00	0.06	0.00	0.30
6	Mtwara	Mtwara	Ziwani	Nalingu	Msimbati	2003/2/1	RW	656762	8856765	-10.3389	40.43167	10.5	49.8	30.5	-15	7.26	—	6.05	6	2.90	3.50	30.13	12.70	32.00	75.00	166.00	0.01	0.54	0.30
(6II)	Mtwara	Mtwara	Ziwani	Nalingu	Msimbati	2003/7/1	RW	629802	8866262	-10.2539	40.18528	8.0	73.9	29.2	94	7.20	—	4.65	6II	0.30	3.70	970.29	13.00	55.00	60.00	239.00	0.01	0.27	0.20
(6III)	Mtwara	Mtwara	Ziwani	Nalingu	Msimbati	2003/7/1	RW	656834	8856125	-10.3447	40.4325	—	86.0	30.7	18	7.91	—	4.55	6III	0.10	3.80	73.25	52.50	87.50	1325.00	177.00	0.00	0.22	0.20
(6IV)	Mtwara	Mtwara	Ziwani	Nalingu	Msimbati	2003/7/1	RW	656617	8856156	-10.3444	40.43056	11.0	622.0	28.7	10	7.33	—	5.05	6IV	0.00	0.00	941.38	147.50	650.00	1925.00	261.00	0.02	1.00	0.00
(6V)	Mtwara	Mtwara	Ziwani	Nalingu	Msimbati	2003/7/1	RW	656555	8856280	-10.3433	40.43	20.0	85.8	29.9	5	7.86	—	4.9	6V	0.80	3.20	54.91	29.70	73.00	75.00	187.00	0.04	0.52	0.20
7	Mtwara	Mtwara	Ziwani	Nalingu	Msangamkuu	2003/2/1	RW	635227	8867352	-10.2439	40.23472	1.0	49.8	30.5	-15	7.26	1.5	5.0	7	0.30	3.20	24.07	4.10	8.00	35.00	90.00	0.49	0.00	0.00
(7II)	Mtwara	Mtwara	Ziwani	Nalingu	Msangamkuu	2003/7/1	RW	635086	8868468	-10.2339	40.23333	10.0	66.7	29.9	74	7.21	2.1	3.4	7II	1.40	3.00	22.84	12.20	37.00	39.00	256.00	0.16	0.74	0.10
(7III)	Mtwara	Mtwara	Ziwani	Nalingu	Msangamkuu	2003/7/1	RW	633859	8867072	-10.2467	40.22222	—	318.0	30.0	83	7.00	3.0	8.8	7III	20.00	47.00	556.07	84.00	375.00	4575.0	127.00	0.00	0.35	0.10
(7IV)	Mtwara	Mtwara	Ziwani	Nalingu	Msangamkuu	2003/7/1	Tube Well	635341	8866559	-10.2511	40.23583	16.0	15.05	29.9	85	7.60	5.1	10.0	7IV	0.50	3.50	13.73	12.10	2.00	25.00	0.00	0.23	0.00	0.10
8	Mtwara	Mtwara	Ziwani	Nanguruwe	Nanguruwe	2003/2/1	RW	613180	8839282	-10.4989	40.03417	172.0	23.1	27.5	86	6.56	1.1	1.1	8	1.50	3.60	27.68	11.30	15.00	50.00	80.00	0.31	0.00	0.00
9	Mtwara	Mtwara	Ziwani	Nanguruwe	Mbawala	2003/1/2	RW	621587	8844538	-10.4508	40.11083	146.0	19.62	27.9	123	6.06	1.5	4.0	9	0.30	2.80	19.11	7.00	25.00	22.50	40.00	0.23	0.00	0.10
10	Mtwara	Mtwara	Mayanga	Mayanga	Kawawa	2003/6/1	RW	620033	8854730	-10.3586	40.09639	70.0	19.40	24.9	152	5.98	—	2	10	1.50	3.80	22.67	4.00	0.00	25.00	77.00	0.08	0.07	0.30
11	Mtwara	Mtwara	Kitaya	Kitaya	Kitaya	2003/2/1	TDW	629843	8824103	-10.6353	40.18694	19.0	16.13	30.6	-7	6.96	2.9	3	11	7.10	4.70	10.10	14.50	87.50	65.00	63.00	9.50	0.00	0.00
12	Mtwara	Mtwara	Kitaya	Kitaya	Arusha Chini	2003/2/1	BH	624793	8827634	-10.6036	40.14083	38.5	65.1	28.5	179	7.78	—	60.0	12	0.60	4.10	95.80	29.30	9.00	107.50	93.00	0.00	0.27	0.10
13	Mtwara	Mtwara	Kitaya	Kiromba	Mayembe Juu	2003/2/1	TDW	619897	8820519	-10.6681	40.09611	93.5	27.3	29.1	35	6.48	2	2	13	2.00	5.80	42.81	3.00	12.50	130.00	28.00	0.46	0.00	0.00
14	Mtwara	Mtwara	Kitaya	Mahurunga	Kitumguli	31/12/2002	RW	640542	8834945	-10.5369	40.28444	15.5	81.2	27.7	174	7.22	0.5	3.6	14	12.00	45.00	104.27	14.20	15.00	230.00	86.00	0.25	0.27	0.10
15	Mtwara	Mtwara	Kitaya	Mahurunga	Mahurunga	31/12/2002	RW	639453	8833692	-10.5481	40.27444	13.5	81.4	27.2	167	7.29	1.5	5	15	0.36	17.00	89.36	12.30	27.00	210.00	102.00	0.12	0.08	0.00
16	Mtwara	Mtwara	Dihimba	Dihimba	Dihimba	31/12/2002	BH	606989	8849133	-10.4097	39.9775	70.5	97.4	28.0	135	6.72	—	82.5	16	0.65	3.40	107.59	21.40	75.00	245.00	40.00	0.17	0.30	0.00
17	Mtwara	Mtwara	Dihimba	Dihimba	Mpondomo	31/12/2002	(No GW Source)	—	—	—	—	—	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
	Mtwara	Mtwara			Mbae	2003/6/1	BH	626357	8860227	-10.3086	40.15389	23.0	80.5	28.1	73	6.95	—	—	Mbae	2.00	3.00	77.22	12.50	137.5	202.50	58.00	0.06	0.32	0.00
18	Mtwara	Tandahimba	Namikupa	Mihambwe	Mihambwe	2003/4/1	(No GW Source)	587489	8803497	-10.8228	39.80028	—	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
19	Mtwara	Tandahimba	Namikupa	Kitama	Kitama	2003/4/1	TDW	578944	8813416	-10.7333	39.72194	230.0	10.72	27.9	16	6.03	3.4	3.4	19	4.00	0.92	4.60	17.00	25.00	20.00	44.00	5.04	0.00	0.00
20	Mtwara	Tandahimba	Namikupa	Kitama	Mitondi A	2003/4/1	TDW	578739	8817363	-10.6978	39.72	252.5	20.2	29.4	8	5.90	—	2	20	1.30	4.30	11.57	22.00	0.00	20.00	78.00	5.26	0.00	0.00
21	Mtwara	Tandahimba	Namikupa	Mkoreha	Misutini	2003/4/1	(No GW Source)	584049	8801008	-10.8453	39.76889	246.0	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
22	Mtwara	Tandahimba	Litehu	Luagala	Litehu	2003/4/1	TDW	556171	8838114	-10.5103	39.51333	339.0	7.5	26.9	224	5.30	3.15	3.15	22	8.00	7.00	7.12	1.50	0.00	167.50	20.00	0.72	0.00	4.60
23	Mtwara	Tandahimba	Litehu	Luagala	Mmeda	2003/4/1	TDW	553271	8838954	-10.5028	39.48694	341.0	13.32	25.9	159	5.95	—	0	23	2.80	4.20	10.88	7.90	0.00	25.00	48.00	1.77	0.00	0.00
24	Mtwara	Tandahimba	Litehu	Luagala	Mabeti	2003/4/1	TDW	552786	8844083	-10.4564	39.48222	352.0	14.26	26.3	163	6.21	—	0	24	3.20	3.70	22.13	4.50	25.00	197.50	34.00	0.86	0.00	0.00
25	Mtwara	Tandahimba	Litehu	Mkwiti	Mkwiti Chini	2003/4/1	SP	536443	8852826	-10.3775	39.33278	203.5	74.0	29.4	187	7.24	—	—	25	0.00	2.40	33.68	23.00	25.00	285.00	36.00	2.06	0.00	0.80
26	Mtwara	Tandahimba	Litehu	Ngunja	Namindondi Juu	2002/6/12	SP	549308	8849519	-10.4072	39.45056	331.0	106.5	26.3	93	7.65	0	—	26	0.00	0.24	105.25	25.30	0.00	404.00	25.00	0.15	0.05	0.40
	Mtwara	Tandahimba			Likolombe Chini	2002/6/12	RW with HP	546552	8854730	-10.3603	39.42528	171.0	128.5	27.9	-36	7.81	—	—	26B	0.00	0.00	62.52	103.00	48.00	215.00	343.00	0.19	0.00	2.90
27	Mtwara	Tandahimba	Litehu	Ngunja	Nanjanga	2003/5/1	(No GW Source)	541482	8841424	-10.4806	39.37917	602.5	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
28	Mtwara	Tandahimba	Litehu	Ngunja	Mkuti	2003/1/5	(No GW Source)	542242	8836647	-10.5239	39.38611	554.0	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
29	Mtwara	Newala	Newala	Nanguruwe	Mnanje	2003/1/3	(No GW Source)	533740	8785700	-10.9847	39.30889	623.0	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
30	Mtwara	Newala	Newala	Mnekachi	Kilidu	2003/3/1	(No GW Source)	533732	8804846	-10.8114	39.30861	641.0	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
31	Mtwara	Newala	Chilangala	Mnyambe	Mnima	2003/4/1	SP	510805	8821333	-10.6625	39.09889	603.0	11.92	24.8	262	4.53	—	—	31	0.40	4.00	11.00	1.50	0.00	35.00	0.00	0.08	0.00	0.20
32	Mtwara	Newala	Chilangala	Chilangala	Miyuyu	2002/7/12	SP	507969	8833885	-10.5489	39.07278	893.0	6.2	21.8	76	8.60	0	0	YY-Sp-32	3.20	2.20	6.56	1.30	8.00	10.40	14.00	0.69	0.00	0.50
33	Mtwara	Newala	Chilangala	Chilangala	Namangudu	2003/4/1	(No GW Source)	528458	8838092	-10.5108	39.26	715.5	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
34	Mtwara	Newala	Kitangari	Kitangari	Mitanga	2003/3/1	(No GW Source)	538086	8829111	-10.5919	39.34806	—	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
35	Mtwara	Newala	Kitangari	Kitangari	Likwaya	2003/3/1	(No GW Source)	535289	8828999	-10.5931	39.3225	—	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
36	Mtwara	Newala	Kitangari	Malatu	Malatu Juu	2003/3/1	(No GW Source)	528316	8809551	-10.7689	39.25889	646.0	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—

RESULT OF GROUNDWATER QUALITY ANALYSIS (2/3)

JICA_ID	Region	District	Division	Ward	Village_Name	Result of Field Measurement														Laboratory analysis Results									
						Sampling Date	Type of Source	Source UTM-E (m)	Source UTM-N (m)	Source LAT (deg)	Source LON (deg)	Source Elev (m)	EC (mS/m)	Temp (deg)	ORP (mV)	pH	DTW (m below GL)	Well Depth (m)	Sample No.	Calcium Ca (mg/l)	Magnesium Mg (mg/l)	Sodium Na (mg/l)	Potassium K (mg/l)	Sulfate SO_4 (mg/l)	Chloride Cl (mg/l)	Bicarbonate HCO_3 (mg/l)	Total Iron Fe (mg/l)	Fluoride F (mg/l)	Manganese Mn (mg/l)
37	Mtwara	Newala	Kitangari	Mchemo	Mdimba	2003/3/1	(No GW Source)	532139	8808766	-10.7761	39.29389	625.0	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
38	Mtwara	Newala	Kitangari	Chiwonga	Chiwonga	2003/3/1	(No GW Source)	537073	8833991	-10.5478	39.33889	631.0	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
39	Mtwara	Newala	Kitangari	Chiwonga	Mmulunga	2003/3/1	(No GW Source)	540685	8830931	-10.5756	39.37194	—	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
	Mtwara	Newala			Kitangari	27/12/2002	BH(Well-6)	530616	8820410	-10.6708	39.28	383.0	23.8	26.9	77	4.68	—	120	KTG	0.00	1.01	27.08	2.50	0.00	90.00	0.00	0.04	0.18	0.30
	Mtwara	Newala			Kitangari	27/12/2002	Treated Water	530616	8820410	-10.6708	39.28	383.0	22.4	27.4	53	4.65	—	120	KTG-AT	0.00	0.88	27.48	2.90	0.00	70.00	0.00	0.04	0.00	0.20
	Mtwara	Newala			Mkunya	27/12/2002	SP	543456	8782661	-11.0119	39.39778	100.0	34.7	27.4	126	8.30	0	—	MKN-SP	0.00	0.05	28.91	28.20	0.00	155.00	14.00	0.06	0.00	0.20
40	Mtwara	Masasi	Chikundi	Nanganga	Nanganga	31/12/2002	RW	519238	8849706	-10.4058	39.17583	220.0	16.8	28.2	17	7.30	5.5	5.5	40	0.00	0.52	12.47	3.70	3.00	17.50	57.00	0.06	0.19	0.30
41	Mtwara	Masasi	Lisekese	Lisekese	Namkungwi	31/12/2002	BH	468869	8812438	-10.7428	38.71528	406.5	312.0	27.9	157	6.93	—	80	41	0.60	212.00	150.17	10.40	0.00	765.00	231.00	0.00	0.67	0.50
42	Mtwara	Masasi	Lisekese	Mikangaula	Kilosa	26/12/2002	TDW	460957	8803608	-10.8228	38.64278	329.0	10.53	28.3	-40	7.35	1.3	1.5	42	4.70	4.00	13.55	4.00	87.00	25.00	32.00	4.60	0.00	0.00
43	Mtwara	Masasi	Lisekese	Namatutwe	Chikoweti	30/12/2002	BH	462351	8820776	—	—	423.5	312.0	27.7	105	6.95	—	70.5	43	3.08	1.30	53.00	37.30	1.00	5250.00	208.00	0.11	0.24	3.70
44	Mtwara	Masasi	Lisekese	Namatutwe	Mlingula	30/12/2002	TDW	465654	8812445	—	—	414.0	9.34	26.1	110	6.85	3.5	3.5	44	0.50	5.20	14.01	5.50	87.50	105.00	8.00	8.70	0.00	1.90
45	Mtwara	Masasi	Lisekese	Lukuledi	Chiwale	30/12/2002	TDW	459751	8828253	—	—	439.5	9.95	28.4	161	6.40	3.5	3.5	45	2.60	3.80	7.51	4.20	12.50	55.00	34.00	3.44	0.00	0.00
46	Mtwara	Masasi	Nanyumbu	Nanyumbu	Nanyumbu	2002/12/12	BH(JM-5)	443946	8767256	-11.1511	38.48667	274.7	130.6	28.9	-12	6.82	(4.76)	80	46	0.40	8.40	130.88	1.30	0.00	155.00	405.00	0.00	1.31	0.20
47	Mtwara	Masasi	Nanyumbu	Nanyumbu	Namasogo	26/12/2002	SP	439655	8777242	-11.0608	38.4475	330.5	11.53	31.2	11	7.35	—	—	47	4.20	3.80	11.32	14.50	0.00	20.00	12.00	3.08	0.00	0.00
48	Mtwara	Masasi	Lulindi	Namalenga	Msanga	30/12/2002	TDW	520113	8798273	-10.8711	39.18417	455.5	22.1	28.6	121	6.58	2.3	2.3	48	10.40	4.80	22.80	12.00	0.00	260.00	52.00	6.32	0.00	0.00
49	Mtwara	Masasi	Chiungutwa	Chiungutwa	Mpeta	30/12/2002	RW	494146	8799499	-10.86	38.94639	251.0	15.86	28.0	25	6.54	1.2	—	49	3.60	5.30	21.74	3.30	1.00	40.00	19.00	0.31	0.00	0.10
50	Mtwara	Masasi	Chiungutwa	Mbuyuni	Mitonji	30/12/2002	BH	502279.0	########	-11.0	39.0	243.5	271.0	28.6	-73	6.62	(64-68)	70.0	50	0.00	1.06	326.44	7.70	250.0	5650.00	281.00	0.00	2.18	0.00
51	Lindi	Kilwa	Pwani	Kikole	Migeregere	2002/12/12	BH	525358	9025225	-8.81833	39.23056	116.7	—	—	—	—	(73.2)		(No Sample)	—	—	—	—	—	—	—	—	—	—
52	Lindi	Kilwa	Miteja	Tingi	Mtandango	2002/12/12	TDW	528431	9055703	-8.5425	39.25833	42.0	3.1	36.1	135	8.42	3.3	5.5	52	6.40	17.40	3.33	3.10	0.00	10.40	19.00	2.76	0.00	0.00
53	Lindi	Kilwa	Miteja	Kinjumbi	Somago Ndumbo	2002/12/12	RW with HP	531451	9072274	-8.39278	39.28556	18.5	266.0	27.7	-69	6.36	4.5	4.5	53	1.00	14.80	433.30	94.00	315.00	195.00	206.00	3.24	0.40	0.30
54	Lindi	Kilwa	Pande	Pande Mikoma	Pande Plot	2002/11/12	BH(JL-3)	561729	8990149	-9.13472	39.56194	39.0	616.0	29.0	179	6.37	(28)	71.9	54	0.00	0.08	900.70	21.00	370.00	1130.00	122.00	0.05	0.31	1.00
55	Lindi	Kilwa	Pande	Pande Mikoma	Mtitimira	2002/11/12	TDW	561766	8986211	-9.17083	39.56222	68.5	14.5	28.0	109	7.03	5.8	7	55	2.80	3.00	15.50	12.90	7.00	24.00	19.00	0.48	0.00	0.00
56	Lindi	Kilwa	Pande	Lihimalyoao	Lihimalyao	2002/11/12	TDW	568767	8969021	-9.32611	39.62611	38.0	18.6	28.9	177	7.19	5.3	5.3	56	9.40	2.80	28.59	5.20	1.00	32.50	18.00	0.40	0.00	0.0
57	Lindi	Kilwa	Pande	Lihimalyoao	Namakongoro	2002/11/12	TDW	567355	8974154	-9.27972	39.61333	52.3	43.5	29.0	182	7.08	6.65	7	57	20.00	61.00	70.99	84.50	20.00	85.50	32.00	0.21	0.00	0.2
58	Lindi	Kilwa	Pande	Mandawa	Mandawa	2002/12/12	SP	547826	8964099	-9.37111	39.43556	38.0	113.4	27.4	120	6.82	—	—	58	0.60	18.40	59.71	1.30	105.00	74.00	141.00	0.00	0.34	0.3
59	Lindi	Kilwa	Pande	Mandawa	Kiwawa	2002/12/12	TDW	539791	8984742	-9.18444	39.36222	115.0	149.3	28.3	113	7.00	Shallow	Shallow	59	18.00	40.50	165.38	8.70	280.00	107.50	241.00	0.29	0.25	0.0
(59B)	Lindi	Kilwa			Nangurukuou	2002/12/12	SP	542565	9029648	-8.77806	39.38694	119.5	127.1	30.8	50	6.27	—	—	59B	18.50	26.50	206.28	19.70	65.00	435.00	20.00	0.75	0.17	0.0
	Lindi	Kilwa			Njianne	2002/12/12	BH (by RIPS)	528258	9060182	-8.50222	39.25667	43.0	1000<	—	—	—	—	51	(No Sample)	—	—	—	—	—	—	—	—	—	—
60	Lindi	Lindi	Mtama	Nyangao	Chiwerere	2003/5/1	SP	520822	8853960	-10.3675	39.19028	211.0	153.6	30.1	153	7.90	—	—	60	0.40	3.10	15.91	5.00	100.00	262.50	283.00	0.01	1.12	0.30
61	Lindi	Lindi	Mtama	Nyengedi	Nyengedi	14/12/2002	RW	547093	8866887	-10.2503	39.43	127.5	41.1	28.4	-84	6.76	6	7	61	0.26	9.40	54.90	8.70	12.00	115.00	52.00	8.25	0.00	0.70
(61II)	Lindi	Lindi	Mtama	Nyengedi	Nyengedi	14/12/2002	obe Well with HP	547979	8865172	-10.2658	39.43806	109.0	38.1	27.5	-67	6.84	7.0	9.8	61II	0.00	0.46	50.06	11.30	0.00	34.00	50.00	13.10	0.00	0.50
62	Lindi	Lindi	Mtama	Nyengedi	Mtumbya	14/12/2002	TDW	552280	8859808	-10.3142	39.4775	205.0	102.5	33.5	24	6.06	1	1.5	62	10.50	39.00	103.39	38.10	29.00	237.50	0.00	3.13	0.00	0.20
63	Lindi	Lindi	Mtama	Mtua	Kilimahewa(Muta)	2002/9/12	SP	550725	8869389	-10.2275	39.46306	91.0	16.7	29.0	109	7.60	0		63	0.00	0.59	14.42	15.60	0.00	44.25	26.00	0.38	0.00	0.40
64	Lindi	Lindi	Sudi	Sudi	Madangwa	2002/9/12	SP	595857	8869652	-10.2244	39.87528	72.0	171.0	27.2	118	6.98	0		64Sp	0.64	0.37	150.19	6.40	105.00	315.00	397.00	0.02	0.35	0.20
65	Lindi	Lindi	Sudi	Sudi	Hingewali	2003/5/1	DW	587850	8872732	-10.1967	39.80194	244.5	119.5	—	—	6.38	1.5	1.5	65	2.20	7.00	162.07	9.20	4.0	470.00	90.00	1.07	0.16	0.00
66	Lindi	Lindi	Nyangamara	Nyangamara	Madingo	14/12/2002	Stream Water	572953	8849227	-10.4094	39.66667	125.0	134.1	25.5	144	8.35	—	—	66	1.30	19.00	46.06	17.90	68.00	197.50	341.00	0.04	0.36	0.3
67	Lindi	Lindi	Nyangamara	Mandwanga	Chiuta	14/12/2002	SP	567931	8840115	-10.4919	39.62083	273.5	46.6	26.2	193	7.75	—	—	67	7.40	14.60	56.55	6.00	0.00	120.00	13.00	0.02	0.00	0.1
68	Lindi	Lindi	Nyangamara	Mandwanga	Malungo	14/12/2002	TDW	573817	8831839	-10.5667	39.67472	295.5	104.6	34.1	89	7.48	0.8	1.5	68	5.20	18.20	146.38	39.50	0.00	95.00	44.00	0.08	0.00	0.0
69	Lindi	Lindi	Mingoyo	Kiwalala	Kiwalala	14/12/2002	RW	559492	8873577	-10.1894	39.54333	52.0	10.5	27.5	123	5.84	0.5	1	69	5.40	8.80	27.40	6.50	11.00	41.00	13.00	0.03	0.13	0.3
70	Lindi	Lindi	Mingoyo	Mnolela	Mnolera	2002/5/1	RW	581627	8868792	-10.2325	39.67861	137.5	152.4	26.1	112	6.81	2	2	70	0.30	6.40	109.39	36.50	775.00	57.50	300.00	0.06	0.65	0.00
70(II)	Lindi	Lindi	Mingoyo	Mnolela	Mnolera	2002/5/1	TDW	580682	8869177	-10.2292	39.73667	161.0	39.9	27.7	132.0	6.63	4.0	4.2	70 II	1.90	19.80	34.01	44.50	14.00	80.00	0.00	0.00	0.00	0.00
71	Lindi	Lindi	Rondo	Chiponda	Chiodya	2002/9/12	SP	545471	8878596	-10.1444	39.415	458.0	19.9	26.1	174	6.54	0		71B-Sp	3.40	6.20	27.08	1.70	13.00	45.50	0.00	0.12	0.11	0.4
72	Lindi	Lindi	Ngapa	Ngapa	Kinengene	14/12/2002	BH	562940	8901491	-9.93694	39.57417	114.0	58.8	28.1	-27	8.76	3.7	56.0	72	4.80	1.20	128.27	1.50	25.00	155.00	191.00	0.00	0.17	0.0
(72-b)	Lindi	Lindi			Kinengene	14/12/2002	RW	568721	8897455	-9.97333	39.62694	55.5	119.7	27.2	6	7.43	6	6	72-b	0.26	0.00	115.25	10.20	80.00	19.40	218.00	0.16	0.52	0.5
73	Lindi	Lindi	Mchinga	Mchinga	Kilangala	13/12/2002	BH(JL-2)	564037	8924684	-9.72722	39.58889	104.0	60.2	30.5	69	7.88	(Artesian)	94.5	73	12.60	6.20	26.12	6.30	23.00	77.00	490.00	0.07	0.12	0.2
74	Lindi	Lindi	Mchinga	Kilolombwani	Kilolombwani	13/12/2002	BH	574940	8936054	-9.62417	39.68306	71.0	416.0	30.8	74	7.68	—	76	74	25.00	24.50	824.84	30.60	155.00	1045.00	25.00	0.07	0.26	0.0

RESULT OF GROUNDWATER QUALITY ANALYSIS (3/3)

JICA_ID	Region	District	Division	Ward	Village_Name	Result of Field Measurement														Laboratory analysis Results									
						Sampling Date	Type of Source	Source UTM-E (m)	Source UTM-N (m)	Source LAT (deg)	Source LON (deg)	Source Elev (m)	EC (mS/m)	Temp (deg)	ORP (mV)	pH	DTW (m below GL)	Well Depth (m)	Sample No.	Calcium Ca (mg/l)	Magnesium Mg (mg/l)	Sodium Na (mg/l)	Potassium K (mg/l)	Sulfate SO_4 (mg/l)	Chloride Cl (mg/l)	Bicarbonate HCO_3 (mg/l)	Total Iron Fe (mg/l)	Fluoride F (mg/l)	Manganese Mn (mg/l)
75	Lindi	Lindi	Mipingo	Mipingo	Lihimilo	13/12/2002	TDW	552440	8928263	-9.695	39.47806	140.0	218.0	25.1	0	6.84	0	0	75	0.60	17.00	135.27	14.20	500.00	205.00	183.00	0.34	0.45	0.1
76	Lindi	Lindi	Nangaru	Chikonji	Chikonji	14/12/2002	Tube Well	562935	8901569	-9.86972	39.57417	111.5	48.9	28.5	-8	8.86	0.0	70.0	76	6.00	1.40	109.12	1.00	1.00	45.00	162.00	0.01	0.22	0.3
77	Lindi	Ruangwa	Ruangwa	Malolo	Nanganga	19/12/2002	RW	516348	8850774	-10.3964	39.14972	204.0	194.9	27.7	70	7.33	3.35	4	77	2.80	19.20	255.48	17.10	310.00	497.50	184.00	0.01	0.33	0.1
78	Lindi	Ruangwa	Ruangwa	Likunja	Chilangalile	19/12/2002	(No Source)	VO(483742)	/O(8876680)	-10.161944	38.8516667	VO(364)	—	—	—	—	—	—	(No Sample)	—	—	—	—	—	—	—	—	—	—
79	Lindi	Ruangwa	Ruangwa	Narun'gombe	Machanganja	19/12/2002	TDW	478941	8899888	-9.95194	38.80778	254.0	61.8	28.0	-32	8.21	3	3	79	4.80	17.60	44.06	5.80	29.00	17.40	175.00	1.13	0.00	0.0
80	Lindi	Ruangwa	Ruangwa	Narun'gombe	Liuguru	19/12/2002	TDW	487857	8890839	-10.0339	38.88917	310.5	9.9	25.8	56	8.28	2.3	2.5	80	7.50	4.50	3.96	9.00	0.00	7.50	33.00	0.57	0.00	0.3
81	Lindi	Ruangwa	Ruangwa	Namichiga	Mihewe	19/12/2002	RW	486419	8901353	-9.93889	38.87611	250.5	226.0	27.4	145	8.02	1	6	81	3.40	10.40	151.22	16.80	1025.00	13.70	275.00	0.09	1.05	0.1
82	Lindi	Ruangwa	Mnacho	Luchelegwa	Chinongwe	19/12/2002	BH with HP (JL-5)	490334	8841479	-10.4803	38.91167	305.5	137.8	28.1	58	6.49	(6.80)	62	82	0.00	20.20	160.86	2.70	57.00	410.00	201.00	0.01	1.14	0.1
83	Lindi	Ruangwa	Mnacho	Luchelegwa	Litama	19/12/2002	TDW	489335	8839918	-10.4944	38.9025	302.0	13.5	29.2	28	6.85	4	4	83	3.00	1.80	19.00	6.00	0.00	35.00	20.00	3.18	0.00	0.1
84	Lindi	Ruangwa	Mnacho	Luchelegwa	Likwachu	19/12/2002	RW	496054	8841746	-10.4781	38.96389	268.0	15.0	28.8	134	5.98	—	—	84	22.60	7.80	14.45	6.80	10.00	4.90	36.00	0.25	0.17	0.0
85	Lindi	Ruangwa	Mnacho	Luchelegwa	Ipingo	19/12/2002	TDW	502241	8849666	-10.4064	39.02056	292.5	14.0	27.5	44	7.70	5.15	6	85	24.80	3.20	7.56	5.10	0.00	7.80	74.00	2.60	0.00	0.0
86	Lindi	Ruangwa	Mandawa	Mandawa	Chibula	19/12/2002	TDW	503941	8902631	-9.92722	39.03583	324.5	132.0	27.2	-25	8.17	4	4	86	1.50	17.60	72.64	11.20	475.00	2.00	229.00	3.10	0.19	0.0
87	Lindi	Nachingwea	Mnero	Mnero Miemben	Mkonjela	18/12/2002	TDW	458853	8861704	-10.2972	38.62417	415.0	6.3	28.9	73	6.45	1.5	1.5	87	13.00	9.20	2.93	4.00	7.00	4.80	21.00	0.90	0.00	0.1
88	Lindi	Nachingwea	Ruponda	Marambo	Litula	18/12/2002	RW	477025	8870859	-10.2144	38.79028	401.0	128.5	27.1	60	6.68	—	16	88	43.00	80.00	62.35	20.60	170.00	60.00	199.00	0.22	0.25	0.3
89	Lindi	Nachingwea	Ruponda	Mkoka	Rweje	18/12/2002	BH with HP	474891	8879884	-10.1328	38.77111	379.0	506.0	28.1	19	7.03	—	140.8	89	10.80	0.40	281.39	30.70	0.00	1045.00	167.00	0.19	0.71	0.7
90	Lindi	Nachingwea	Nambambo	Naipanga	Naipanga	18/12/2002	TDW	481068	8839333	-10.4997	38.82694	351.0	64.2	28.7	133	7.89	1	1	90	2.40	24.00	62.39	17.90	0.00	99.00	11.00	0.04	0.11	0.0
91	Lindi	Nachingwea	Nambambo	Naipanga	Chiumbati Miembe	20/12/2002	TDW	478194	8849952	-10.4036	38.80083	375.0	151.2	28.3	12	5.77	4	4	91	2.40	7.60	89.80	8.70	0.00	537.50	20.00	0.29	0.00	2.0
92	Lindi	Nachingwea	Nambambo	Mkotokuyama	Mandai	20/12/2002	TDW	478456	8857037	-10.3394	38.80333	—	33.4	28.9	18	6.25	4	4	92	8.40	14.40	28.19	3.50	0.00	41.00	42.00	4.80	0.00	0.5
93	Lindi	Nachingwea	Nambambo	Ndomoni	Ndomoni	18/12/2002	RW	480895	8834576	-10.5428	38.82528	313.0	35.8	26.8	41	7.90	5.62	5.62	93	9.80	14.20	17.64	10.60	0.00	46.50	39.00	0.95	0.00	0.0
94	Lindi	Nachingwea	Nambambo	Mtua	Kipara Mtua	20/12/2002	TDW	452576	8853691	-10.3697	38.56667	432.0	19.1	27.4	-6	7.75	4	4	94	8.40	8.20	17.72	1.80	0.00	37.00	34.00	0.10	0.00	0.0
95	Lindi	Nachingwea	Nambambo	Mpiruka	Mpiruka	18/12/2002	RW	382207	8915940	-9.80528	37.92583	499.5	4.6	27.5	100	5.90	1.6	2	95	3.00	1.40	5.39	0.00	0.0	21.00	15.00	0.97	0.00	0.0
96	Lindi	Liwale	Barikiwa	Mlembwe	Mlembwe	17/12/2002	TDW	345857	8930190	-9.675	37.595	691.5	8.0	26.4	161	7.04	0.5	1.2	96	6.00	7.20	4.57	4.30	0.00	7.80	31.00	0.79	0.00	0.1
97	Lindi	Liwale	Liwale	Liwale B	Mikunya	17/12/2002	RW	399001	8917312	-9.79333	38.07917	434.5	10.2	28.7	72	6.23	2.23	3	97	0.00	0.88	3.24	8.10	0.00	2.90	54.00	0.06	0.00	0.0
98	Lindi	Liwale	Liwale	Mihumo	Mihumo	17/12/2002	TDW	380252	8900963	-9.94056	37.9075	509.0	4.9	32.2	45	6.45	2.5	2.5	98	2.40	1.40	2.40	6.50	0.00	7.80	24.00	0.99	0.00	0.0
99	Lindi	Liwale	Liwale	Mbaya	Mbaya	17/12/2002	TDW	385176	8931335	-9.66611	37.95333	434.5	6.5	38.1	96	7.15	3.5	3.5	99	3.80	2.40	3.24	4.50	0.00	150.00	11.00	1.53	0.00	0.0
100	Lindi	Liwale	Liwale	Ngongowele	Ngongowele	17/12/2002	TDW	367620	8883910	-10.0944	37.79194	558.5	12.9	28.1	45	6.78	1.5	1.5	100	12.00	3.80	5.24	2.40	0.00	0.40	48.00	1.85	0.00	3.1

Above WHO Guideline Above Tanzanian Standard Bicarbonate HCO_3 = Total Alkalinity

5-2. Social Survey Report

Mtwara and Lindi Rural Water Supply Project, JICA

Social Survey Report

Prepared for Kokusai Kogyo Ltd by Norconsult Tanzania Ltd

Table of Contents

1. Introduction....3
2. Work Schedule....3
3. Methodology....4
4. Problems Encountered....4
5. General Observations & Main Issues....5

1. Introduction

Kokusai Kogyo has been commissioned to undertake a water study of one hundred villages in Mtwara and Lindi regions. The study consists of several components of which two were sub-contracted to Norconsult Tanzania Ltd: a social survey of the villages, and a water quality assessment of the most important water sources for the same villages. The report is a summary of the work of the social survey team and is the final requirement for completion of the terms of reference for this assignment.

2. Work Schedule

Although the assignment officially commenced on the 2nd of December 2002, field-work did not begin until the 9th of December 2002. Fieldwork was completed on the 17th of January 2003 but work in the Dar-es-Salaam office proceeded to the 24th of January 2003. The following is a table indicating the dates that villages were visited in the field.

Date	Villages
Tue 10-12-02	Pande Plot*, Mtitimira
Wed 11-12-02	Lihimalyao, Namakongoro, Somanga Ndumbo, Mtandango, Migeregere
Thu 12-12-02	Mandawa, Kiwawa
Fri 13-12-02	Mbaya, Mikunya
Sat 14-12-02	Mlembwe, Mihumo, Ngongowele
Mon 16-12-02	Chinongwe*, Litama, Likwachu, Ipingo, Nanganga
Tue 17-12-02	Mihewe, Chilangalile, Liuguru, Chibula, Machanganja
Wed 18-12-02	Naipanga, Kipara Mtua, Ndomoni, Mandai, Chiumbati Miembeni, Rweje, Mkonjela, Litula
Thu 19-12-02	Mpriruka, Namasogo, Nanyumbu*, Mlingula, Namkungwi
Fri 20-12-02	Mpeta, Msanga, Mitonji, Chikoweti, Chiwale
Sat 21-12-02	Nanganga, Kilosa
Sun 29-12-02	Ziwani*, Msanga Mkuu
Mon 30-12-02	Arusha Chini*, Mbawala
Tue 31-12-02	Nanguruwe, Maranje, Mtiniko, Maramba
Thu 02-01-03	Mandangwa, Hingawali, Mnolela
Fri 03-01-03	Kilangala*, Kilolombwani, Lihimilo
Sat 04-01-03	Chiodya, Chikonji, Kinengene, Kiwalala, Nyengedi, Chikonji, Chiodya, Kilimahewa (Mtua), Chiwerere, Mtumbya
Mon 06-01-03	Miyuyu, Mnima, Malatu Juu, Mdimba, Kilidu
Tue 07-01-03	Mikwanga[1], Namangudu, Nanjanga, Chiwonga, Mkuti, Mnanje, Mmulunga, Mkwiti Chini, Namindondi Juu
Wed 08-01-03	Chiuta, Malungo, Madingo, Litehu, Mmeda, Mabeti
Thu 09-01-03	Mihambwe, Kitama I, Mitondi A, Misufini, Dihimba, Mpondomo, Kawawa
Fri 10-01-03	Msimbati, Kitunguli, Mahurunga
Sat 11-01-03	Kitaya, Mbembaleo, Mayambe Juu

[1] Likwaya & Mitanga have united to form one village. This brings the number of villages to 99.

3. Methodology

The methodology used in each village consisted of administration of a structured questionnaire, supplemented by unstructured questions, followed by village mapping. In the six villages[2] that formed part of the pilot project, a household survey was also conducted. The village and household questionnaires were prepared by Kokusai Kogyo and revised both in Dar es Salaam and during fieldwork. Additional questions were included to complement those already on the questionnaire:

- Names of the sub-villages
- Gender disaggregation of the village government members
- Type of village: traditional or *ujamaa*.
- Amount of money in the water fund and whether the water committee has opened a bank account for the water fund.
- Distance and location to health facilities if none is in the village.
- Whether traditional birth attendants (TBAs) have received training.
- Whether rural medical aid is available.
- Whether village water sources are utilised by more than one village.
- How much money villagers would be willing to pay for the bucket (20 litre).

Other changes include the elimination of question 5 (name of interviewee) because the respondents in almost all cases were members of the village government.

The village surveys were conducted after members of the village government (most importantly the chairman and the village executive officer — the VEO) and representatives from the Water Committee (WC) were summoned to the village government office. In cases when village government representation was low, community members not in the government or WC were invited to attend. After the questionnaire was completed, participants were given the opportunity to ask questions or comment on the JICA Water Supply Project. These, together with our general observations, are presented in section 5.0.

Village mapping was carried out either after or during the meeting with the village government. In most cases, a small group comprising of village youth and/or government members together with a teacher drew the village map.

For the household surveys, we interviewed heads of household and/or their spouses living in the vicinity of the JICA water facilities and those collecting water. Both users and non-users were interviewed.

The question on monthly household expenditure was tackled by general consensus of interviewees during the village government on the average daily consumption of an average household given that all items utilised, whether self-produced or bought, have a value in the village. Thus, a summation of the value of the meals, fuel, and other household requirements was done and a monthly figure derived. The amount, therefore, does not represent the actual cash-in-hand of the average villager.

4. Problems Encountered

Attendance by village government members was generally low. In most cases less than a quarter of the 25 government members were present. The absence of any advance notification,

[2] Kilangala, Arusha, Pande Plot, Ziwani, Chinongwe and Nanyumbu.

combined with the planting season meant that many villagers were in their *shambas* when the meetings were conducted, including many government members and members of the water committee. This also accounted for the low participation of women in these meetings, particularly female government members. However, even when women were present their contribution was negligible. In a few cases, such as Machanganja and Chiwerere, no government members were available and the meeting was held with community members, the elderly, influential people in the community, and other political leaders.

Some of the information required in the questionnaire was not readily available in the village government. In fact, no village was able to provide precise data on:

- the number of households run by women
- the number of households that have moved immigrated in the last 3 years
- the acreage of crops cultivated

In cases such as these, approximations and guess work by the interviewees was necessary.

5. General Observations & Main Issues

Water Committees

- Many water committees are poorly managed and have so far failed to mobilise their community to contribute to the water fund. This is due mostly to low capacity and the fact that many water committee members do not know their responsibilities.
- In some areas, water committees were established by members of the village government without the participation of the local community.

Water Fund

- The amount collected for the village water fund ranged from nothing to more than a million shillings. Villages with bigger water problems had managed to collect larger water funds. However, this is also due to good management and unity within the village. In general, most water funds have not exceeded 200,000 shillings. Reasons for this include the fact that prior misuse of funds (evidenced in the pilot villagers and others) has eroded the villagers' trust in the water committee and they are not willing to contribute further; loss of hope that contributing to the water fund will result in a water project. For example, in Nanguruwe, the water fund bank account has been taken over by a few village government members and this has generated hostility within the community.
- There seems to have been a miscommunication between the district water officers and the village government about how much money the water fund should contain. The amount of TShs 200,000 is just the minimum amount required and is only enough to construct a shallow well. However, this was taken to be the maximum amount required for the water fund and may account for the fact that many of the villages have water funds that do not exceed TShs 200,000.
- In many cases, the water fund consists almost entirely of a contribution from the village government, not the villagers. The result is the absence of a feeling of ownership by the community that does not bode well for the future management of a water facility.
- Most of the respondents in Tandahimba district informed us that TShs 5 from each kilo of cashew nuts sold was deducted by the district council for an alleged water fund. However, the villagers in question (such as Kitama I and Mabeti) have to-date not been beneficiaries of any water project funded by the council. The confusion this has raised has resulted in

small water funds in Tandahimba villages, as most villagers assume that there is already a water fund at district level raised from their cash crop taxes.

Village Government: Low Capacity and Lack of Leadership

- Many village governments are not aware of their responsibilities vis-à-vis the water committee and the community or of the organisational structures of the various village committees. In a few cases, government members are also members of the water committee.
- In Machanganja & Chiwerere it was observed that the village government is weak and *de-facto* non-existent respectively.

Relationship between the Village Government & the Water Committee

- There is evidence of poor collaboration between the village government and the water committee in many villages. For example, they do not hold regular public meetings to inform the public about progress

Relationship between the District Water Office and the Village Government

- Historically, the district water office has not fulfilled its responsibilities in the villages e.g. the promotion and publication of the water policy. Furthermore, there is little communication between district water officials and the village government. Many village leaders had not been informed about what stage the JICA Water Supply project has reached.

Observations & Feedback from Pilot Villages

- The area surrounding the public faucet is dirty.
- During the rainy season, most community members revert to using their traditional sources e.g. Chinongwe, Kilangala. In Pande Plot, very few villagers use the JICA water facility because the water is too salty (except for construction purposes).
- The contractors used to construct the water facilities had poor workmanship: the water tanks in Pande Plot and Arusha are leaking. Furthermore, it is not clear whose responsibility it is to carry out maintenance and repair of the water facility.
- The perception of the local communities is that JICA water is clean water, even though they fully aware that it is that water that is causing diarrhoea e.g. Arusha village.
- The manner in which the project was implemented was not in accordance with the principles of community participation and ownership. The contractors' priority to complete construction did not allow for the flexibility necessary to ensure community participation. As a result, many villagers were paid for their participation in construction, which should have been voluntary. In order to avoid this, it is imperative to begin mobilising the community, strengthening the water committee and preparing construction schedules prior to the project implementation.
- Household Survey. The household questionnaire was used to interview people living near the JICA water facility or fetching water from the JICA water facility. Therefore it is only reflective of changes in the lives of those households which use the water facility, and not of the village as a whole. For example, in Chinongwe, only residents of the sub-village where the water facility is located use it.

Observations & Feedback from most Villages:

- The lack of feedback and information dissemination to the selected villages between 2000-2002 has resulted in the loss of hope that the project will be implemented at all and an accompanying reluctance to contribute to the water fund. Interviewed communities are eager to become more involved in the JICA Water Supply Project.

General

- In general, hygiene education is very poor. In certain villagers, with the exception of a few households most households have temporary latrines. These are generally responsible for some water-borne diseases.
- The villages of Kiwawa and Chiwerere do not have a village government or water committee and we recommend that they should not be considered for a water project.
- In Chiwerere, the meeting with the local community revealed they do not perceive that there is a major water problem affecting them.

Comments on the Survey

- Water Sources. At times, there was some confusion between the villagers and ourselves in connection with what was really meant by the terms 'stream'/'pond', 'springs'/'dug-well'. In these cases we relied on the response given as we did not have enough time to visit the source in order to confirm the answer. In many cases the water sources were far away from the village itself.

5-3. Result of Site Village Selection

Target Villages and Facilities

ID No.	Region	District	Village Name	Population	Initial Evaluation	Final Evaluation	Source	Depth	Number of HP Wells	Number of MP Wells	Feasibility for WTP				Judgement	
											Generator		Public Power Supply		Level 1	Level 2
											Monthly charge	Bucket charge	Monthly charge	Bucket charge		
1	Mtwara	Mtwara	Mbembaleo	6,092	A		BH	60 m	17		O	O				2
2	Mtwara	Mtwara	Maranje	2,553	B		BH	140 m		1	O	O				2
3	Mtwara	Mtwara	Mtiniko	1,269	B		BH	70 m	4						1	
4	Mtwara	Mtwara	Malamba	1,693	A		BH	140 m		1	X					2*
5	Mtwara	Mtwara	Ziwani	7,290	A		BH	0 m		0						2
6	Mtwara	Mtwara	Msimbati	5,788	A		BH	90 m	16			O				2
7	Mtwara	Mtwara	Msangamkuu	5,419	B		BH	80 m	15		O	O				2
8	Mtwara	Mtwara	Nanguruwe	4,875	B		BH	160 m		1	O	O				2
9	Mtwara	Mtwara	Mbawala	2,230	D		BH									
10	Mtwara	Mtwara	Kawawa	3,840	A		BH	110 m	11			X			1*	
11	Mtwara	Mtwara	Kitaya	3,010	A		BH	70 m	8		O	O			1	
12	Mtwara	Mtwara	Arusha Chini	1,800	A		BH	0 m		0						2
13	Mtwara	Mtwara	Mayembe Juu	965	B		BH	120 m	3		O	O			1	
14	Mtwara	Mtwara	Kitumguli	4,928	A		BH	80 m	14			O				2
15	Mtwara	Mtwara	Mahurunga	5,035	A		BH	70 m	14			O				2
16	Mtwara	Mtwara	Dihimba	1,726	B		BH	60 m	5						1	
17	Mtwara	Mtwara	Mpondomo	2,780	B		BH	60 m	8			O			1	
18	Mtwara	Tandahimba	Mihambwe	3,569	B		BH	120 m	10		X	X			1*	
19	Mtwara	Tandahimba	Kitama	6,743	B		BH	70 m	19		O	O				2
20	Mtwara	Tandahimba	Mitondi A	1,450	B		BH	80 m	4						1	
21	Mtwara	Tandahimba	Misutini	961	B		BH	200 m		1	X	O				2
22	Mtwara	Tandahimba	Litehu	914	B	C	BH									
23	Mtwara	Tandahimba	Mmeda	895	D		BH									
24	Mtwara	Tandahimba	Mabeti	924	B		BH	160 m		1	X					2*
25	Mtwara	Tandahimba	Mkwiti Chini	1,125	D		SP									
26	Mtwara	Tandahimba	Namindondi Juu	1,686	D		SP									
27	Mtwara	Tandahimba	Nanjanga	1,659	D		BH									
28	Mtwara	Tandahimba	Mkuti	1,762	D		BH									
29	Mtwara	Newala	Mnanje	848	D		BH									
30	Mtwara	Newala	Kilidu	1,936	D		BH									
31	Mtwara	Newala	Mnima	1,264	D		BH									
32	Mtwara	Newala	Miyuyu	924	D		SP									
33	Mtwara	Newala	Namangudu	785	D		BH									
34	Mtwara	Newala	Mitanga	1,383	B		BH	150 m		1		O				2
35	Mtwara	Newala	Likwaya	552	B	C	BH									
36	Mtwara	Newala	Malatu Juu	2,427	D		BH									
37	Mtwara	Newala	Mdimba	1,482	D		BH									
38	Mtwara	Newala	Chiwonga	1,694	D		BH									
39	Mtwara	Newala	Mmulunga	1,733	B		BH	120 m	5		O	O			1	
40	Mtwara	Masasi	Nanganga	2,595	A		BH	60 m	7		O	O			1	
41	Mtwara	Masasi	Namkungwi	1,457	A		BH	180 m		1	X					2*
42	Mtwara	Masasi	Kilosa	2,177	A		BH	140 m		1	O	O				2
43	Mtwara	Masasi	Chikoweti	3,563	A	C	BH									
44	Mtwara	Masasi	Mlingula	3,611	A	C	BH									
45	Mtwara	Masasi	Chiwale	10,408	A		BH	190 m		1		O				2
46	Mtwara	Masasi	Nanyumbu	1,311	A		BH	80 m	4						1	
47	Mtwara	Masasi	Namasogo	1,419	A		BH	180 m		1	X	O				2
48	Mtwara	Masasi	Msanga	1,037	A		BH	200 m		1	X					2*
49	Mtwara	Masasi	Mpeta	2,304	A		BH	60 m	6		O	O	O	O	1	
50	Mtwara	Masasi	Mitonji	2,720	A	C	BH									
51	Lindy	Kilwa	Migeregere	1,501	A		BH	150 m		1	O					2
52	Lindy	Kilwa	Mtandango	974	D		BH									
53	Lindy	Kilwa	Somago Ndumb	4,073	D		BH									
54	Lindy	Kilwa	Pande Plot	3,859	D		BH									
55	Lindy	Kilwa	Mtitimira	1,108	D		BH									
56	Lindy	Kilwa	Lihimalyoao	5,023	D		BH									
57	Lindy	Kilwa	Namakongoro	1,608	D		BH									
58	Lindy	Kilwa	Mandawa	7,579	B		BH	60 m	21		O					2
59	Lindy	Kilwa	Kiwawa	1,930	B		BH	130 m		1	O					2
60	Lindy	Lindi	Chiwerere	1,541	B		BH	60 m	4						1	
61	Lindy	Lindi	Nyengedi	4,086	B		BH	60 m	11		X		O		1	
62	Lindy	Lindi	Mtumbya	1,341	B		BH	130 m		1	X	X				2*
63	Lindy	Lindi	Kilimahewa(Mut	4,716	A		SP	0 m		1		O				2
64	Lindy	Lindi	Madangwa	6,007	A		SP	0 m		1	O	O				2
65	Lindy	Lindi	Hingewali	4,245	B	C	BH									
66	Lindy	Lindi	Madingo	1,728	B		BH	140 m		1		O				2
67	Lindy	Lindi	Chiuta	2,249	B		BH	190 m		1	O	O				2
68	Lindy	Lindi	Malungo	1,679	B		BH	160 m		1		O				2
69	Lindy	Lindi	Kiwalala	10,152	A		BH	60 m	28			O		O		2
70	Lindy	Lindi	Mnolera	7,898	A	C	BH									
71	Lindy	Lindi	Chiodya	3,672	D		SP									
72	Lindy	Lindi	Kinengene	9,670	A		BH	90 m	27			O				2
73	Lindy	Lindi	Kilangala	9,405	A		BH	0 m								2
74	Lindy	Lindi	Kilolombwani	1,243	D		BH									
75	Lindy	Lindi	Lihimilo	1,134	B		BH	170 m		1	X	X				2*
76	Lindy	Lindi	Chikonji	2,562	B		BH	70 m	7			O			1	
77	Lindy	Ruangwa	Nanganga	1,233	D		BH									
78	Lindy	Ruangwa	Chilangalile	1,036	B		BH	100 m	3						1	
79	Lindy	Ruangwa	Machanganja	2,042	B		BH	130 m		1	X	X				2*
80	Lindy	Ruangwa	Liuguru	4,005	B		BH	100 m	11		X				1*	
81	Lindy	Ruangwa	Mihewe	1,090	B	C	BH									
82	Lindy	Ruangwa	Chinongwe	3,640	B		BH	60 m	10		X				1	
83	Lindy	Ruangwa	Litama	1,658	B		BH	90 m	5						1	
84	Lindy	Ruangwa	Likwachu	1,956	B		BH	60 m	5		O				1	
85	Lindy	Ruangwa	Ipingo	1,052	B		BH	80 m	3						1	
86	Lindy	Ruangwa	Chibula	1,278	B		BH	130 m		1	X					2*
87	Lindy	Nachingwea	Mkonjela	3,928	B		BH	150 m		1	X					2*
88	Lindy	Nachingwea	Litula	1,922	B		BH	130 m		1	O	X				2
89	Lindy	Nachingwea	Rweje	1,449	D		BH									
90	Lindy	Nachingwea	Naipanga	19,231	D		BH									
91	Lindy	Nachingwea	Chiumbati Miem	1,467	D		BH									
92	Lindy	Nachingwea	Mandai	1,745	B		BH	150 m		1		O				2
93	Lindy	Nachingwea	Ndomoni	1,318	D		BH									
94	Lindy	Nachingwea	Kipara Mtua	2,759	B		BH	170 m		1		O				2
95	Lindy	Nachingwea	Mpiruka	2,810	B		BH	90 m	8		X				1	
96	Lindy	Liwale	Mlembwe	1,700	A		BH	120 m	5		X				1	
97	Lindy	Liwale	Mikunya	1,179	A		BH	90 m	3						1	
98	Lindy	Liwale	Mihumo	1,898	A		BH	90 m	5						1	
99	Lindy	Liwale	Mbaya	1,545	A		BH	60 m	4						1	
100	Lindy	Liwale	Ngongowele	1,384	A	C	BH									

*WTP NOT ENOUGH

Pilot Project Village
Level 2 Water Supply facility with Deep Well
Level 2 Water Supply facility with Spring
Excluded Village

6. References

6. References

No.	Title	Type Book/Video Map/Photo	Original/ Copy	Publisher	Year issured
1	Watering White Elephants? : Lessons from Donor Funded Planning and Implementation of Rural Water Supplies in Tanzania	Book	Copy	Ole Therkildsen	1988
2	Wizara ya Maji na Maendeleo ya Mifugo, Fungu 49 Mpango wa bajeti wa mwaka 2002/2003, Randama iliyowasilishwa Kwenye kikao cha kamati ya bunge ya kisekta ya uzalishaji mali	Book	Copy	Ministry of Water and Livestock Development	2002
3	Small towns water supply and sanitation Project Preparatory study, Project document, Vol.1-Main report	Book	Copy	BCEOM HYDOROCONSEIL, M-Konsult	2002
4	Small towns water supply and sanitation Project Preparatory study, Project document, Vol.2-Annex	Book	Copy	BCEOM HYDOROCONSEIL, M-Konsult	2002
5	Monduli District Rural water supply study Final complete study report	Book	Copy	Norconsult	2002
6	The national cholera toolkit, User's guide: A participatory approach for prevention and control of cholera in Tanzania	Book	Copy	Ministry of Health Tanzania	1998
7	Borehole completion report {Mtwara Region} : Contractor:-Drilling and Dam Construction Agency	Book	Copy	CONCERN- Tanzania	
8	Designing water supply and sanitation projects to meet demand in rural and peri-urban communities: Book 3: Ensuring the participation of the poor	Book	Copy	Deverrill, Bibby, Wedgwood, Smout, DFID, WEDC	
9	Completion report for three boreholes drilled at Pawaga-Kinyika village Client: CONCERN IRINGA	Book	Copy	HYDROTECH	2002
10	Completion report for three boreholes at Pawaga-Iringa Client: CONCERN WORLDWIDE	Book	Copy	HYDROTECH	2001
11	The Shinyanga Experience: Water User Group concept as a sustainable management system for hand pump wells	Book	Copy	Miert, Binamungu	2001
12	Report on groundwater exploration in selected villages of Namupa, Nyengedi, Nahukahuka and Nachunyu Wards, Lindi rural District Lindi Region	Book	Copy	DDCA	2000
13	Trainer's Guide for DWST Training	Book	Original	Ministry of Water and Livestock Development	
14	Trainer's Guide for Facilitator Training	Book	Original	Ministry of Water and Livestock Development	
15	District Operational Manual (DOM)	Book	Original	Ministry of Water and Livestock Development	

No.	Title	Type Book/Video Map/Photo	Original/ Copy	Publisher	Year issured
16	Facilitator's Manual	Book	Original	Ministry of Water and Livestock Development	
17	Project Operational Manual: Annexes	Book	Original	MoWLD, Rural Water Supply Department	2001
18	Design manual for water supply and waste water disposal, Second draft, Vol.I	Book	Copy	Ministry of Water Design Section	1997
19	National Water Policy	Book	Copy	Ministry of Water and Livestock Development	2002
20	Medium term strategic plan:2001-2006	Book	Copy	Ministry of Water and Livestock Development Rural Water Supply Division	2001
21	CONCERN Tanzania Annual review April 2001 to March 2002	Book	Original	CONCERN	2002
22	Health Statistics Abstract 2002 Vol.I Burden of Disease and Health Facility Utilization Statistics	Book	Original	Ministry of Health	2002
23	Health Statistics Abstract 2002 Vol.II Inventory Statistics	Book	Original	Ministry of Health	2002
24	RIPS Publications (6) A list of Reports & publications on RIPS supported projects and activities. Reports & publications with relevance to the Programme area.	Book	Copy	RIPS	2002
25	Paths for Change II: Reflections along the way	Book	Original	RIPS	2002
26	Mtwara Region, Socio Economic Profile	Book	Copy	Regional Commissioner's Office	
27	Water Lifting Series of manuals on drinking water supply, vol.7	Book	Copy	Erich Baumann SKAT	2000
28	Project Operation Manual	Book	Copy	MoWLD, Rural Water Supp Department	2001
29	PHAST Step-by-step guide: A participatory approach for the control of diarrhoeal disease	Book	Copy	PHAST, Participatory Hygiene and Sanitation Transformation Series	
30	Project Appraisal Document on a Proposed Credit in the Amount of SDR 20.8 Million to the United Republic of Tanzania for the Rural Water Supply and Sanitation Project	Book	Original	World Bank Africa Regional Office	2002
31	Tariff Book of Harbour Dues and Charges	Book	Original	Tanzania Harbours Authority	1999
32	Subsidiary Legislation: The regulations of wages and terms of employment ordinance (Cap.300)	Book	Copy		2002

No.	Title	Type Book/Video Map/Photo	Original/ Copy	Publisher	Year issured
33	Acts Supplement: An Act to amend certain Labour Laws	Book	Copy	The United Republic of Tanzania	1975
34	Law of Contract Ordinance	Book	Copy		1961
35	Employment Chapter 366 of the Laws (Revised): Annual supplement, 1956	Book	Copy	Tanganika	1957
36	Procedures and Criteria for Registraion of Contractors: second edition	Book	Original	Contractors Registration Board	2000
37	2002 Population and Housing Census General Report	Book	Copy	Central Census Office, National Bureau of Statistics, President's Office Planning and Privatization	2003
38	Design Manual for Water Supply and Waste Water Disposal, Second draft, Vol.II	Book	Copy	Ministry of Water and Design Section	1997