

資料一6 事業事前計画表（事業化調査時）

<p>1. 案件名</p>
<p>タンザニア国ザンジバル市街地給水計画</p>
<p>2. 要請の背景</p>
<p>ザンジバルにおける給水事業は、1920年代に地下水・湧水を水源とした給水施設が建設され、1990年までに100kmにおよぶ送配水管、送水場及び7ヶ所の配水池が整備されたが、財政難により施設の改修や拡張が行われず老朽化して水の需要に対して供給能力が極端に不足している。既存の水道施設から供給を受けている住民の給水量は不十分であり、施設の老朽化のため汚水が流入し水質が悪化していることが水因性疾病の罹患率を高くしており、生活環境の改善が緊急の課題となっている。</p> <p>タンザニア国（以下「タ」国とする）政府は経済回復計画の中で、重点分野としてBHN改善のため安全な飲料水を安定的に確保することを目的として、わが国に対して飲料水供給施設改善を内容とする無償資金協力を要請した。</p> <p>本計画の上位計画として、財務経済省が2000年1月にザンジバル・ビジョン2020（ZANZIBAR VISION 2020）をUNDPの支援を受けて策定した。この中の政策目標は、社会経済インフラとして、①良好な水に経済的にアクセスできること、②適切な水資源管理により全ての人、セクターに継続的に水が供給されることを目標とし、これによって社会経済の成長と発展に資することができる。</p>
<p>3. プロジェクト全体計画概要</p>
<p>(1) プロジェクト全体計画の目標</p> <p>①ザンジバル市都市/西部行政区のプロジェクト対象地域において給水量が増加し、住民に安全な水が安定的に供給される。</p> <p>②本プロジェクトの裨益人口はザンジバル市の都市/西部行政区(面積約240km²)の住民457,000人(2010年)である。</p> <p>(2) プロジェクト全体計画の成果</p> <p>① <u>上水道施設が整備される。</u></p> <p>(3) プロジェクト全体計画の主要活動</p> <p>① <u>上水道施設を整備する。</u></p> <ul style="list-style-type: none"> ・井戸水源を建設する。 ・配水池を整備する。 ・送配水管を建設する。 <p>② <u>技術訓練を実施する。</u></p> <p>③ 施設運営のための人員を配置する。</p> <p>④ 施設の運転管理を実施する。</p> <p>(4) 投入（インプット）</p> <p>ア <u>日本側：無償資金協力 20.90 億円</u></p> <p>イ 相手国側：</p> <ul style="list-style-type: none"> (ア) 必要な人員を配置する (イ) フェンス・電力引込工事、銀行取極に係る経費を負担する。 (ウ) 施設・機材の運営・維持管理に係る経費を負担する。 <p>(5) 実施体制</p> <p>実施機関：水建設省水開発局（DWD）、なお、ザンジバル水道公社(ZAWA)の設立が予定されており、設立後はZAWAが実施機関となる。</p> <p>主管官庁：水建設省(MWCEL)</p>
<p>4. 無償資金協力案件の内容</p>
<p>(1) サイト</p> <p>タンザニア連合共和国ザンジバル都市/西部地域</p>

(2) 概要

施設

- | | | |
|-----------|---------------------------|--------|
| ① 新規水源の建設 | 井戸 11 本の建設 | |
| ② 配水池の整備 | 鉄筋コンクリート製配水池 | 4 池の建設 |
| | 送水ポンプ場 1 カ所 (ポンプ 4 台) の更新 | |
| ③ 送配水管の整備 | ダクタイル鋳鉄管 (口径 150~700mm) | 約 44km |

ソフトコンポーネント

- ・水開発局 DWD(あるいは ZAWA)を対象に施設の運転管理に関する技術指導
- ・水開発局 DWD(あるいは ZAWA)を対象に組織強化に関する指導(管理職研修)
- ・水開発局 DWD(あるいは ZAWA)を対象にザンジバル市民への衛生面での啓蒙活動

(3) 相手国側負担事項

- ①フェンス工事
- ②電力引込み工事

(4) 概算事業費

概算事業費： 20.95 億円 (無償資金協力：20.90 億円、タンザニア国負担：0.05 億円)

(5) 工期

詳細設計・入札期間を含め約 35 ヶ月

5. 外部要因リスク

- ・大規模な自然災害が発生しない。
- ・突発的な政情不安が発生しない。

6. 過去の類似案件からの教訓の活用

- ・特になし

7. プロジェクト全体計画の事後評価に係る提案

(1) プロジェクト全体計画の目標達成を示す成果指標：

- ①ザンジバル地域の給水量が 14,000m³/day 増加する。

	2002 年	2010 年
行政人口	391,002 人	495,000 人
給水人口	約 350,000	457,000
給水量	40,100 m ³ /day	54,100 m ³ /day

②配水システムの改善により、既存配水システムが機能すれば現在約 50%の地域で達成できていない必要給水水圧(5m)を 90%の地域で達成可能とする。

(2) 評価のタイミング

：
2009 年以降 施設完工後 1 年経過後。

資料-7 収集資料リスト

番号	名称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
1	Zanzibar Urban Water Supply Development Plan 1991-2015 (Sep. 1991)	図書	コピー	DWD	1991
2	Zanzibar Urban Water Supply Development Plan Annex (Sep. 1991)	図書	コピー	DWD	1991
3	Zanzibar Urban Water Supply Development Plan Map (Sep. 1991)	地図	コピー	DWD	1991
4	Zanzibar Urban Water Supply Development Phase II 1997-2000 (Jul. 1996)	図書	コピー	DWD	1996
5	Zanzibar Urban Water Supply Development 1 st Implementation Phase 1991-1995 (Phase I) Final Report (Nov. 1995)	図書	コピー	DWD	1995
6	Zanzibar Vision 2020 (Jan. 2002)	図書	コピー	財務省	2002
7	Zanzibar Poverty Reduction Plan (Jan. 2002)	図書	コピー	財務省	2002
8	Thematic Papers for the Launching of Zanzibar Poverty Reduction Plan	図書	コピー	MWCEL	2002
9	The Development of Water Resources in Zanzibar Final Report (Oct. 1994)	図書	コピー	MWCEL	1994
10	Rehabilitation and Improvement of Zanzibar Municipality Sewerage, Drainage and Solid Waste Disposal System (Jan. 1996)	図書	コピー	Zanzibar Municipal Council	1996
11	Mission Report Laboratory and the Environment (Jun. 1994)	図書	コピー	DWD	1994
12	Water Quality Programme	図書	コピー	DWD	
13	Water Supply Design Manual Chapter 3 Water Quality (Dec. 1986)	図書	コピー	DWD	1986
14	The Mtoni Water Source (Sep. 1993)	図書	コピー	DWD	1993
15	Women and Children in Tanzania Volume II Zanzibar (Jun. 1995)	図書	コピー	DWD	1995
16	地形図 Zanzibar (縮尺 1/100,000)	地図	オリジナル	Department of Lands and Survey	
17	地形図 Zanzibar Z-2 (縮尺 1/50,000)	地図	オリジナル	Department of Lands and Survey	

番号	名称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
18	地形図 Zanzibar Z-4 (縮尺 1/50,000)	地図	オリジナル	Department of Lands and Survey	
19	地形図 Zanzibar Town (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
20	地形図 Bububu (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
21	地形図 Ndagaa (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
22	地形図 Machui (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
23	地形図 Mfenesini (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
24	地形図 Kiembe Samaki (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
25	地形図 Mwera (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
26	地形図 Fuoni (縮尺 1/10,000)	地図	オリジナル	Department of Lands and Survey	1982
27	Hydrogeological Map of Zanzibar	地図	コピー	DWD	1991
28	National Water Policy (Draft) (1999)	図書	コピー	MWCEL	1999
29	Water Tariff for Urban Area of Zanzibar (Draft) (1999)	図書	コピー	MWCEL	1999
30	Establishment of Zanzibar Water Act (Draft) (1999)	図書	コピー	MWCEL	1999
31	Water Supply Rules and Procedures (Draft) (1999)	図書	コピー	MWCEL	1999
32	National Environmental Policy Zanzibar	図書	コピー	MWCEL	
33	Act No.5 of 2002	図書	コピー	MWCEL	2002
34	MWCWL 組織図	図面	コピー	MWCEL	
35	保健省組織図	図面	コピー	保健省	
36	DWD 予算書 2003/2004	図面	コピー	DWD	
37	保健省予算書 2003/2004	図書	コピー	保健省	
38	DWD 職種別人員数	資料	コピー	DWD	
39	DWD 研修計画	資料	コピー	DWD	
40	ザンジバル観光開発マスタープラン	図書	コピー	Commission of Tourism	2003
41	Water Policy on Zanzibar	図面	コピー	MWCEL	
42	A Bill for an Act of Water Supply Rules and Procedure 2004 (Draft)	図書	コピー	DWD	2004
43	National Land Use Plan (Jan. 1995)	図面	コピー	MWCEL	1995
44	Tourism Zoning Plan Main Report	図面	コピー	MWCEL	
45	A Bill for Water Resources Act 2004 (Draft)	図書	コピー	DWD	2004

番号	名称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
46	A Bill for an Act of Zanzibar Water Supply Authority 2004 (Draft)	図書	コピー	DWD	2004
47	Engineering and Management Studies Zanzibar and Pemba Rural Water Supply	図書	コピー	DWD	
48	2002 Population and Housing Census General Report	図書	オリジナル	国家統計局	2003
49	2002 Population and Housing Census Vol. II Age and Sex Distribution	図書	オリジナル	国家統計局	2003
50	District Profile-Urban	図書	コピー	統計局	
51	District Profile-West	図書	コピー	統計局	
52	Water Analysis Report (2003-2004)	資料	コピー	DWD	2003
53	Saateni Station 全体平面図(縮尺:1/250)	図面	コピー	DWD	1991
54	Saateni Station No.1 配水池構造図(縮尺:1/100)	図面	コピー	DWD	1991
55	Saateni Station No.2 配水池構造図(縮尺:1/100, 1/200)	図面	コピー	DWD	1991
56	Saateni Station No.3 配水池構造図(縮尺:1/100, 1/200)	図面	コピー	DWD	1991
57	Saateni Station ポンプ室平面・断面図(縮尺:1/100)	図面	コピー	DWD	1991
58	Saateni Station No. 1 高架水槽構造図(縮尺:1/100)	図面	コピー	DWD	1991
59	Saateni Station No. 2 高架水槽構造図(縮尺:1/100)	図面	コピー	DWD	1991
60	Saateni Station 高架水槽配管詳細図	図面	コピー	DWD	1991
61	Saateni Station 流量計室平面・断面図(縮尺:1/100)	図面	コピー	DWD	1991
62	Welezo 配水池全体平面図(縮尺:1/1,000)	図面	コピー	DWD	1991
63	Welezo 配水池平面・断面図(縮尺:1/100)	図面	コピー	DWD	1991
64	Welezo 地上タンク構造図(縮尺:1/100)	図面	コピー	DWD	

番号	名称	形態 図書・ビデオ 地図・写真等	オリジナル・コピー	発行機関	発行年
65	Wnara wa Mnao 高架/地下タンク平面・断面図	図面	コピー	DWD	
66	既存送配水管網図	図面	コピー	DWD	
67	下水配管図(縮尺:1/500)	図面	コピー	Zanzibar Municipal Council	
68	Kianga 井戸ポンプ室平面・断面図(縮尺:1/20)	図面	コピー	DWD	1991
69	Mwembe Mchomeke 井戸ポンプ室平面・断面図 (縮尺:1/20, 1/50)	図面	コピー	DWD	1991
70	Mtoni Spring 取水施設平面図(縮尺:1/300)	図面	コピー	DWD	1991
71	Paved Road Network Condition	資料	コピー	Department of Roads, Zanzibar	2004
72	National History of Cholera Outbreaks in Zanzibar 1978-2002	図書	コピー	Ministry of Health and Social Welfare	2004
73	Rehabilitation and Extension of Zanzibar Municipal Sewerage, Drainage and Solid Waste Disposal Sysytem	資料	コピー	KfW	2003
74	既存井戸揚水試験結果	資料	コピー	DWD	
75	既存井戸地質柱状図	資料	コピー	DWD	

資料-8 その他資料

資料 8-1 管網計算入力データ

節点データ

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J1	17	0		9
J2	10	0		9
J3	30	0		18
J4	40	0		18
J5	40	0		18
J6	35	0		16
J7	37	0		16
J8	50	0		16
J9	60	0		16
J10	75	0		16
J11	76.25	0		10
J12	76	0		10
J13	40	0		16
J14	40	0		16
J15	55	0		16
J16	76	0		10
J17	75.8	0		10
J18	30	0		16
J19	75.8	0		10
J20	75.5	0		10
J21	30	0		16
J22	30	0		16
J23	30	0		16
J24	75.8	0		10
J25	75.5	0		10
J26	16	0		17
J27	70	0		10
J28	76.5	0		10
J29	20	0		16
J30	15	0		17
J31	15	0		17
J2440	25	175.55		11
J33	20	0		7
J34	20	0		7
J35	20	0		7
J36	20	0		7
J37	15	0		11
J38	15	0		11
J39	15	0		11
J40	60	0		15
J41	70	0		15
J42	45	0		13
J43	45	0		13
J44	86.5	0		13
J45	86	0		13
J46	4	0		5
J47	4	0		5
J48	4	0		5
J49	8	0		5
J50	36.5	0		5
J51	36	0		5
J52	36.5	0		5
J53	36	0		5
J54	8	0		5
J55	8	0		5
J100	10	0		282.61

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J2000	6	61.91		2
J2010	8	133.45		3
J2020	8	97.75		4
J2030	20	97.75		4
J2040	18	97.75		4
J2050	10	97.75		4
J2060	18	97.75		4
J2070	22	61.91		2
J2080	8	97.75		4
J2090	20	61.91		2
J2100	18	348.76		7
J2110	21	61.91		2
J2120	20	61.91		2
J2130	15	61.91		2
J2140	15	61.91		2
J2150	5	61.91		2
J2160	7	61.91		2
J2170	25	61.91		2
J68	25	0		2
J69	39	0		2
J70	38.5	0		2
J2210	25	61.91		2
J2220	24	61.91		2
J2230	20	348.76		7
J2240	15	1210.52		8
J2250	8	133.45		3
J2260	7	133.45		3
J2270	9	133.45		3
J2280	6	133.45		3
J2290	5	133.45		3
J2300	10	133.45		3
J2310	15	133.45		3
J2320	17	133.45		3
J2330	17	348.76		7
J2340	17	348.76		7
J2350	20	276.42		6
J2360	18	348.76		7
J2370	24	348.76		7
J2380	20	348.76		7
J2390	20	348.76		7
J2400	20	348.76		7
J2410	20	276.42		6
J2420	20	276.42		6
J2430	20	276.42		6
J71	20	0		6
J2450	20	276.42		6
J2460	20	276.42		6
J2470	20	276.42		6
J2480	25	172.63		10
J2490	30	1210.52		8
J2500	30	172.63		10
J2510	32	172.63		10
J2520	35	172.63		10
J2530	30	172.63		10
J2540	28	172.63		10
J2550	27	172.63		10

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J110	4	0		Port
J120	4	0		Port
J130	4	0		Port
J140	4	0		Port
J150	4	19.76		1
J160	5	19.76		1
J170	4	19.76		1
J180	6	19.76		1
J190	5	19.76		1
J200	3	19.76		1
J210	3	19.76		1
J220	5	61.91		2
J230	5	61.91		2
J240	7	61.91		2
J250	9	61.91		2
J260	9	61.91		2
J270	9	61.91		2
J280	8	97.75		4
J290	4	133.45		3
J300	6	133.45		3
J310	10	133.45		3
J320	6	97.75		4
J330	7	97.75		4
J340	12	97.75		4
J350	15	97.75		4
J360	10	282.61		5
J370	15	133.45		3
J380	9	133.45		3
J390	10	133.45		3
J400	10	133.45		3
J410	17	276.42		6
J420	16	133.45		3
J430	17	97.75		4
J440	17	97.75		4
J450	20	276.42		6
J460	20	348.76		7
J470	10	282.61		5
J480	10	282.61		5
J490	10	282.61		5
J500	10	282.61		5
J510	15	282.61		5
J520	25	97.75		4
J530	20	348.76		7
J540	25	348.76		7
J550	20	282.61		5
J560	23	276.42		6
J570	30	276.42		6
J580	33	276.42		6
J590	40	172.63		10
J600	32	172.63		10
J610	22	276.42		6
J620	24	348.76		7
J630	24	348.76		7
J640	15	175.55		11
J650	22	175.55		11
J660	20	175.55		11
J670	17	175.55		11
J680	12	55.18		12
J690	17	55.18		12
J700	30	172.63		10

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J2560	20	175.55		11
J2570	45	172.63		10
J2580	24	175.55		11
J2590	22	175.55		11
J2600	23	348.76		7
J2610	20	175.55		11
J2620	20	175.55		11
J72	18	0		11
J73	43.5	0		11
J74	43	0		11
J75	18	0		11
J2670	20	175.55		11
J2680	21	175.55		11
J2690	20	175.55		11
J2700	18	175.55		11
J2710	15	175.55		11
J2720	15	175.55		11
J2730	22	175.55		11
J2740	20	175.55		11
J2750	15	175.55		11
J2760	16	175.55		11
J2770	17	55.18		12
J2780	14	55.18		12
J2790	14	55.18		12
J2800	15	55.18		12
J2810	28	56.91		18
J2820	10	43.16		19
J2830	15	175.55		11
J2840	15	175.45		17
J2850	17	175.45		17
J58	17	0		9
J59	17	0		9
J60	17	0		9
J61	17	0		9
J62	10	0		9
J2860	10	1210.52		8
J2870	25	1210.52		8
J63	8	0		5
J64	4	0		5
J65	4	0		5
J2880	15	282.61		5
J2890	16	97.75		4
J66	30	0		18
J2900	20	276.42		6
J2910	5	19.76		1
J2920	3	100		Port
J2930	17	175.55		11
J895	50	27.32		13
J905	50	27.32		13
J885	50	27.32		13
J2940	50	27.32		13
J865	20	365.7		9
J867	20	365.7		9
J67	22	72.03		14
J868	22	72.03		14
J2950	20	172.63		10
J2960	25	365.7		9
J995	50	34.6		15
J2970	23	56.91		18
J2980	10	43.16		19

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J710	26	276.42		6
J720	23	276.42		6
J730	25	175.55		11
J740	22	175.55		11
J750	15	175.55		11
J760	22	348.76		7
J56	21	0		18
J770	23	56.91		18
J780	27	56.91		18
J790	15	175.55		11
J57	30	0		10
J800	15	282.61		5
J810	15	282.61		5
J820	10	365.7		9
J830	10	365.7		9
J840	15	365.7		9
J850	14	365.7		9
J860	15	365.7		9
J870	25	72.03		14
J880	45	72.03		14
J890	50	27.32		13
J900	50	27.32		13
J910	50	27.32		13
J920	55	27.32		13
J930	45	27.32		13
J940	50	27.32		13
J950	40	72.03		14
J960	48	72.03		14
J970	75	72.03		14
J980	95	34.6		15
J990	63	34.6		15
J1000	50	34.6		15
J1010	50	146.87		16
J1020	40	146.87		16
J1030	25	146.87		16
J1040	80	146.87		16
J1050	4	133.45		3
J1060	4	133.45		3
J1070	4	133.45		3
J1080	8	61.91		2
J1090	4	133.45		3
J1100	6	133.45		3
J1110	5	61.91		2
J1120	4	61.91		2
J1130	4	61.91		2
J1140	4	19.76		1
J1150	4	61.91		2
J1160	4	19.76		1
J1170	4	19.76		1
J1180	4	19.76		1
J1190	8	19.76		1
J1200	4	19.76		1
J165	4	19.76		1
J1210	5	19.76		1
J1220	8	19.76		1
J1230	5	19.76		1
J1240	3	19.76		1
J1250	7	19.76		1
J1260	4	19.76		1
J1270	4	61.91		2

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J2990	15	175.55		11
J3000	26	56.91		18
J3010	25	56.91		18
J2180	20	348.76		7
J2190	23	276.42		6
J2200	40	172.63		10
J32	26	0		11
J2630	16	55.18		12
J975	70	34.6		15
J76	25	0		
J77	25.5	0		
J78	25	0		
J79	0	0		
J80	0	0		
J81	4	0		
J82	4	0		
N3	20	-1440	5	
N4	20	-1440	5	
N5	20	0	5	
J10000	0	0		
J10010	0	0		
N6	20	-1440	5	
N8	20	-1440		
N7	20	-1440	5	
N9	20	-1440	5	
J10020	0	0		
J10030	0	0		
J10040	0	0		
J10050	0	0		
N10	20	-1440	5	
N11	20	-1440	5	
N12	20	-1440	5	
N13	20	-1440	5	
J10060	0	0		
J10070	0	0		
J10080	0	0		
J10090	0	0		
J10100	0	0		
J10110	0	0		
J10120	0	0		
J20000	49	0		
J20010	69	0		
J20020	69	0		
J20030	69	0		
J20040	95	0		
J20050	95	0		
J20060	50	0		
J20070	50	0		
J20080	15	0		
J20090	40	0		
J20100	40	0		
J20110	30	0		
J20120	23	0		
J20130	15	0		
J20140	10	0		
J20150	10	0		
J20160	30	0		
J20170	25	0		
J20180	10	0		
J20190	10	0		

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J1280	4	61.91		2
J1290	4	61.91		2
J1300	8	61.91		2
J1310	3	19.76		1
J1320	5	19.76		1
J1330	5	19.76		1
J1340	5	19.76		1
J1350	5	19.76		1
J1360	5	19.76		1
J1370	5	19.76		1
J1380	4	19.76		1
J1390	4	19.76		1
J1400	4	19.76		1
J1410	4	19.76		1
J1420	6	19.76		1
J1430	6	19.76		1
J1440	6	19.76		1
J1450	5	19.76		1
J1460	5	19.76		1
J1470	6	19.76		1
J1480	5	19.76		1
J1490	6	19.76		1
J1500	8	19.76		1
J1510	5	19.76		1
J1520	5	19.76		1
J1530	4	19.76		1
J1540	6	19.76		1
J1550	6	19.76		1
J1560	6	19.76		1
J1570	5	19.76		1
J1580	6	19.76		1
J1590	8	19.76		1
J1600	5	19.76		1
J1610	5	19.76		1
J1620	6	19.76		1
J1630	4	19.76		1
J1640	4	19.76		1
J1650	4	19.76		1
J1660	4	19.76		1
J1670	3	19.76		1
J1680	3	19.76		1
J1690	4	19.76		1
J1700	4	19.76		1
J1710	3	19.76		1
J1720	3	19.76		1
J1730	3	19.76		1
J1740	3	19.76		1
J1750	3	19.76		1
J1760	3	19.76		1
J1770	3	19.76		1
J1780	3	19.76		1
J1790	4	19.76		1
J1800	4	19.76		1
J1810	6	61.91		2
J1820	4	61.91		2
J1830	8	61.91		2
J1840	8	61.91		2
J1850	5	61.91		2
J1860	8	61.91		2
J1870	6	97.75		4

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J20200	0	0		
J20210	10	0		
J20220	26	0		
J20230	22	0		
J20240	24	0		
J20250	24	0		
J20260	20	0		
J20270	45	0		
J20280	30	0		
J20290	28	0		
J20300	25	0		
J20310	20	0		
J20320	0	0		
J20330	10	0		
J20340	10	0		
J20350	15	0		
J20360	10	0		
J20370	25	0		
J20380	20	0		
J20390	17	0		
J20400	10	0		
J20410	22	0		
J20420	22	0		
J20430	25	0		
J20440	22	0		
J20450	20	0		
J20460	17	0		
J20470	18	0		
J20480	20	0		
J20490	4	0		
J20500	4	0		
J20510	4	0		
J20520	4	0		
J20530	3	0		
J20540	3	0		
J20550	5	0		
J20560	5	0		
J20570	6	0		
J20580	8	0		
J20590	8	0		
J20600	9	0		
J20610	9	0		
J20620	7	0		
J20630	5	0		
J20640	10	0		
J20650	10	0		
J20660	15	0		
J20670	30	0		

;ID	Elev (m)	Demand (m ³ /d)	Pattern	Zone
J1880	5	61.91		2
J1890	8	97.75		4
J1900	8	97.75		4
J1910	7	61.91		2
J1920	6	133.45		3
J1930	8	61.91		2
J1940	5	61.91		2
J1950	5	61.91		2
J1960	8	61.91		2
J1970	7	97.75		4
J1980	7	133.45		3
J1990	8	61.91		2

既存水源水位データ

;ID	Head (m)	Pattern	Well No.
S1	17	;Bububu Spring	
S2	10	;Mtoni Spring	
S3	5	;Dimani Spring	
S4	20	;Kianga Well	U-004
S5	20	;M.Mchomeke	U-051
S6	20	;M.Mchomeke	U-001
S7	20	;M.Mchomeke	U-050
S8	20	;M.Mchomeke	U-033
S9	20	;M.Mchomeke	U-019
S10	20	;Kianga	U-032
S11	10	;Chunga	U-008
S12	10	;Chunga	U-026
S13	10	;Chunga	U-009
S14	0	;K.Kikombe	U-014
S15	0	;K.Kikombe	U-027
S16	0	;K.Kikombe	U-035
S17	2	;Mbweni	U-041
S18	2	;Mbweni	U-012
S19	5	;Maungan i	U-034
S20	25	;Dole	
S21	10	;Mfensini	U-011
S22	5	;Semuso	U-039
S23	5	;Monbasa	
S24	5	;Dimani	U-044
S25	5	;Kitosani	U-037
S26	0	;Mbao	
S27	0	;Migombani	U-047

配水池/高架タンクデータ

ID	Elevation (m)	InitLevel (m)	MinLevel (m)	MaxLevel (m)	Diameter (m)	MinVol (m ³)	VolCurve	Remarks
T1	69	5	0.5	6.75	22.2	0		;Welezo1
T2	70	5	1.5	5	12.4	0		;Welezo2
T3	5	1	0.214	1.732	28.3	0		;Saateni1
T4	5	1	0.414	2.312	26.7	0		;Saateni2
T5	3.7	2	0.36	3.73	29.4	0		;Saateni3
T6	7.5	25	23.7	27.45	13	0		;Saateni elevated tank1
T7	55	3	0.5	4.5	9.6	0		;Dimani
T8	70	12	10	15	10	0		;Mfensini
T9	7.5	25	23.7	27.45	13	0		;Saateni elevated tank2
T10	105	3	0	5	10	0		;Dole
T11	20	2	0.8	2.7	12	0		;Mbao
T12	25	12	10.7	13	4.8	0		;Mbao elevated tank
T13	22	17	15	20	7	0		;Monbasa
T14	22	3	0	5	7	0		;
T15	38	3	0	5	10	0		;
T100	95.65	4	0.2	5.2	17.5	0		;
T101	49.8	4	0.2	5.2	26.2	0		;
T102	69.7	5	0.2	5.2	31.9	0		;
T103	69.7	5	0.2	5.2	31.9	0		;

管路データ

ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
1	J1	J55	1000	450	110	0	Open		CI
2	J2	T3	2500	600	110	0	Open		CI
3	J3	J4	1100	150	110	0	Open		AC
4	J5	T7	1	1000	110	0	Open		
5	J6	J10050	800	300	110	0	CV		
6	J7	J8	1400	300	110	0	Open		
7	J8	J9	200	300	110	0	Open		
8	J9	J10	250	300	110	0	Open		
9	J10	J11	1100	300	110	0	Closed		
10	J12	T102	1	1000	110	0	Open		
11	J13	J10100	500	200	110	0	CV		
12	J14	J10090	1400	200	110	0	CV		
13	J10080	J11	1500	200	110	0	Closed		PVC
14	J17	T1	1	1000	110	0	Open		
15	J18	J22	100	200	110	0	CV		PVC
16	J20	T103	1	1000	110	0	Open		
17	T1	T2	650	300	110	0	Closed		
18	J21	J22	1000	200	110	0	CV		PVC
19	J23	J10050	1000	200	110	0	CV		
20	J22	J11	1500	200	110	0	Closed		PVC
21	J25	T2	1	1000	110	0	Open		
22	J26	J29	1000	200	110	0	CV		AC
23	J27	J11	10	200	110	0	Closed		AC
24	J29	J27	5000	200	110	0	Closed		AC
25	J28	J29	1000	200	110	0	Closed		AC
26	J31	J32	10	200	110	0	CV	:1994	PVC
27	J33	J34	100	200	110	0	CV		
28	J35	J34	100	200	110	0	CV		
29	J36	J34	100	200	110	0	CV		
30	J37	J2750	20	200	110	0	CV		
31	J39	J38	50	100	110	0	CV		
32	J40	T10	1000	75	110	0	CV		PE
33	J42	J43	300	100	110	0	Open		
34	J43	J44	1600	100	110	0	Open		
35	J45	T8	1	1000	110	0	Open		
36	T3	T4	10	450	110	0	Open		
37	T3	T5	10	450	110	0	Open		
38	T4	J46	20	450	110	0	Open		
39	T5	J46	20	525	110	0	Open		
40	J46	J47	50	525	110	0	Open		
41	J48	J49	200	375	110	0	Open		
42	J49	J50	100	300	110	0	Open		
43	J51	T6	1	1000	110	0	Open		
44	J49	J52	100	300	110	0	Open		
45	J53	T9	1	1000	110	0	Open		
46	T9	J54	100	300	110	0	CV		
47	T6	J54	100	300	110	0	CV		
48	J55	T3	200	450	110	0	Open		
100	J55	J110	550	375	110	0	Open	:1940	CI
101	J110	J120	500	375	110	0	Open	:1940	CI
103	J120	J130	550	375	110	0	Open	:1940	CI
104	J130	J140	250	375	110	0	Open		CI
105	J140	J2920	250	300	110	0	Open	:1940	CI
106	J150	J160	170	300	110	0	Open	:1949	CI
107	J1200	J165	100	150	110	0	Open	:1949	CI
108	J170	J1800	150	150	110	0	Open	:1949	CI
109	J160	J1200	100	150	110	0	Open	:1949	CI
110	J1160	J1510	140	300	110	0	Open	:1949	CI
111	J1250	J1450	110	150	110	0	Open	:1949	CI
112	J1240	J190	400	150	110	0	Open	:1949	CI
113	J1140	J1310	400	150	110	0	Open	:1950	AC
114	J210	J200	60	150	110	0	Open	:1950	CI

ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
115	J200	J190	300	150	110	0	Open	;1949	CI
116	J1120	J1910	450	150	110	0	Closed	;	CI
117	J240	J250	50	150	110	0	Open	;	AC
118	J250	J260	300	200	110	0	Open	;1970	CI
119	J270	J1300	310	200	110	0	Open	;1969	CI
120	J220	J1290	180	100	110	0	Open	;1950	CI
121	J190	J230	700	100	110	0	Open	;1950	AC
122	J220	J230	500	75	110	0	Open	;	AC
123	J1810	J220	220	100	110	0	Open	;1950	CI
124	J260	J270	40	200	110	0	Closed	;	CI
125	J230	J2000	420	100	110	0	Open	;1950	CI
126	J1080	J2250	100	150	110	0	Open	;	AC
127	J300	J1920	30	100	110	0	Open	;	PVC
128	J310	J240	550	200	110	0	Open	;1970	AC
129	J320	J1870	400	200	110	0	Open	;	AC
130	J280	J330	300	200	110	0	Open	;1950	CI
131	J1060	J290	150	200	110	0	Open	;	AC
132	J290	J310	800	300	110	0	Open	;1970	AC
133	J300	J1100	120	100	110	0	Open	;	AC
134	J1980	J320	350	200	110	0	Open	;1950	AC
135	J1870	J330	400	200	110	0	Open	;1950	AC
136	J330	J340	400	100	110	0	Open	;	AC
137	J2000	J350	520	100	110	0	Open	;1950	CI
138	J340	J350	200	100	110	0	Open	;	AC
139	J100	J490	120	150	110	0	Closed	;	AC
140	J360	J290	450	300	110	0	Open	;1954	AC
49	J54	J100	200	200	110	0	Open	;1950	AC
141	J100	J2300	200	200	110	0	Open	;1950	AC
142	J380	J1100	350	100	110	0	Open	;	AC
143	J380	J390	150	200	110	0	Open	;1950	AC
144	J390	J1980	300	200	110	0	Open	;1950	AC
145	J54	J370	1000	150	110	0	Open	;1959	AC
146	J490	J2240	800	150	110	0	Open	;	AC
147	J2310	J380	200	100	110	0	Closed	;	AC
148	J390	J400	250	100	110	0	Closed	;	AC
149	J370	J2890	950	150	110	0	Open	;1957	AC
150	J400	J410	300	100	110	0	Open	;	AC
151	J410	J420	280	100	110	0	Open	;	AC
152	J1870	J2020	400	100	110	0	Open	;	AC
153	T6	J480	50	150	110	0	CV	;	
154	J500	J360	400	300	110	0	Closed	;1954	AC
155	J480	J470	200	150	110	0	Open	;	AC
156	J480	J510	350	100	110	0	Closed	;	AC
157	J2300	J2880	200	100	110	0	Closed	;	AC
158	J410	J450	420	150	110	0	Open	;1957	AC
159	J420	J430	180	75	110	0	Open	;	AC
160	J2890	J440	800	150	110	0	Open	;	AC
161	J440	J2070	700	150	110	0	Open	;	AC
162	J430	J2320	150	100	110	0	Open	;	AC
163	J540	J2350	250	150	110	0	Open	;	AC
164	J440	J530	700	150	110	0	Open	;	PVC
165	J460	J530	400	150	110	0	Open	;1970	AC
166	J350	J2210	650	100	110	0	Closed	;	AC
167	J2310	J550	200	100	110	0	Open	;	AC
168	J550	J560	400	100	110	0	Open	;	AC
169	J2190	J570	500	100	110	0	Open	;	AC
170	T2	J600	800	200	110	0	Closed	;	AC
171	T2	J590	800	150	110	0	Closed	;	AC
172	J590	J580	400	150	110	0	Open	;	AC
173	J580	J570	300	150	110	0	Open	;	AC
174	J2240	J2490	800	110	110	0	Open	;	PVC
175	J600	J700	450	200	110	0	Open	;	AC
176	J700	J710	500	200	110	0	Open	;1970	AC

ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
177	J710	J2480	250	200	110	0	Open	;1970	AC
178	J710	J720	280	200	110	0	Open	;1970	AC
179	J610	J2350	380	200	110	0	Open	;1970	AC
180	J540	J450	800	150	110	0	Open	;1957	AC
181	J540	J460	650	150	110	0	Open	;1970	AC
182	J610	J620	650	200	110	0	Open	;1970	AC
183	J620	J2370	1000	75	110	0	Open	;	AC
184	J700	J2500	550	110	110	0	Open	;1993	PVC
185	J610	J2590	120	200	110	0	Open	;1970	AC
186	J620	J2580	80	200	110	0	Open	;1970	AC
187	J34	J2380	300	200	110	0	Open	;1970	AC
188	J760	J2600	700	100	110	0	Open	;	AC
189	J2210	J760	1200	150	110	0	Open	;1951	AC
190	J630	J660	1200	200	110	0	Open	;1970	AC
191	J38	J640	150	100	110	0	Open	;	AC
192	J640	J650	800	100	110	0	Open	;	AC
193	J2760	J660	900	160	110	0	Open	;	PVC
194	J2930	J670	500	160	110	0	Closed	;	PVC
195	J650	J760	1000	150	110	0	Open	;1951	AC
196	J660	J670	800	150	110	0	Open	;	AC
197	J730	J740	1900	160	110	0	Open	;	PVC
199	J740	J2610	250	160	110	0	Open	;	PVC
200	J2560	J2440	1600	200	110	0	Open	;1970	AC
201	J38	J680	2500	100	110	0	Open	;	AC
202	J680	J690	1000	100	110	0	Open	;	AC
50	J56	J770	300	200	110	0	Open	;	PVC
203	J670	J750	500	150	110	0	Open	;	AC
51	T7	J780	250	150	110	0	CV	;	AC
204	J750	J2990	2300	150	110	0	Open	;	AC
205	J770	J790	1600	150	110	0	Open	;	AC
206	J780	J3000	3700	150	110	0	Open	;	AC
52	T1	J57	1500	300	110	0	Closed	;	
53	T2	J57	700	300	110	0	Closed	;	
54	J57	J500	1600	300	110	0	Closed	;1954	AC
207	J10	J1040	500	110	110	0	Open	;	PVC
208	J7	J1020	600	110	110	0	Open	;	PVC
209	J1020	J1030	1700	200	110	0	Open	;	GS
210	J7	J1010	2500	110	110	0	Open	;	PVC
211	J1010	J1000	1400	110	110	0	Open	;	PVC
212	J470	J800	700	150	110	0	Open	;	AC
213	J800	J810	900	150	110	0	Open	;	AC
214	J810	J820	1500	150	110	0	Closed	;	AC
215	J820	J830	700	150	110	0	Open	;	AC
216	J830	J840	1700	150	110	0	Open	;	AC
217	J840	J850	1200	100	110	0	Open	;	AC
218	J850	J860	1000	100	110	0	Open	;	AC
219	J860	J865	1500	100	110	0	Open	;	AC
220	J870	J880	800	150	110	0	Open	;	AC
221	J870	J950	1400	75	110	0	Open	;	PE
222	J950	J960	1000	75	110	0	Open	;	PE
55	T8	J900	350	75	110	0	Open	;	
223	J900	J895	10	150	110	0	Open	;	AC
224	J900	J905	10	150	110	0	Open	;	AC
225	J885	J880	1600	150	110	0	Open	;	AC
226	J890	J920	1500	75	110	0	Open	;	PE
227	J920	J930	700	75	110	0	Open	;	
228	J920	J940	1900	75	110	0	Open	;	PE
229	J940	J960	1800	75	110	0	Open	;	PE
230	J975	J995	900	75	110	0	Open	;	PE
231	J990	J1000	800	75	110	0	Open	;	PE
232	J975	J970	1000	75	110	0	Open	;	PE
233	J970	J960	2100	75	110	0	Open	;	PE
234	J41	J975	10	75	110	0	Open	;	PE

ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
235	T10	J980	1200	75	110	0	CV		PE
236	J58	J840	1500	150	110	0	Open		AC
237	J54	J1050	250	450	110	0	Open	:1920	CI
238	J1050	J1060	240	450	110	0	Open	:1920	CI
239	J1060	J1070	300	225	110	0	Open		CI
240	J1060	J1080	1000	300	110	0	Open	:1949	CI
241	J1070	J1090	250	100	110	0	Open		AC
242	J1090	J2290	250	100	110	0	Open		AC
243	J1070	J1110	400	225	110	0	Open	:1940	CI
244	J1110	J1150	200	225	110	0	Open	:1940	CI
245	J1150	J1170	380	225	110	0	Open	:1940	CI
246	J1080	J1120	550	300	110	0	Open	:1949	CI
247	J1120	J1130	50	300	110	0	Open	:1949	CI
248	J1130	J1140	100	300	110	0	Open	:1940	CI
249	J1140	J1380	70	300	110	0	Open	:1949	CI
250	J1380	J1160	140	300	110	0	Open	:1950	CI
251	J1130	J1270	300	100	110	0	Open		AC
252	J1170	J1180	350	150	110	0	Open	:1950	AC
253	J150	J1570	100	150	110	0	Open	:1949	CI
254	J1210	J1480	120	150	110	0	Open	:1949	CI
255	J160	J1190	220	200	110	0	Open	:1950	AC
256	J165	J170	150	150	110	0	Open	:1949	CI
257	J1230	J1220	120	200	110	0	Open	:1950	AC
258	J1200	J1230	50	150	110	0	Open	:1949	CI
259	J1230	J1790	70	100	110	0	Open		AC
260	J1190	J1600	300	200	110	0	Open	:1950	AC
261	J1220	J180	250	150	110	0	Open	:1949	CI
262	J1210	J1580	60	150	110	0	Open	:1949	CI
263	J1610	J1240	150	150	110	0	Open	:1949	CI
264	J1600	J190	550	200	110	0	Open		AC
265	J1270	J1280	200	100	110	0	Open		AC
266	J1290	J210	180	100	110	0	Open	:1950	CI
267	J1280	J1290	300	50	110	0	Open		AC
268	J1300	J1280	450	200	110	0	Open	:1969	CI
269	J1310	J210	280	150	110	0	Open	:1950	AC
270	J1310	J1320	1000	150	110	0	Open		CI
271	J1380	J1390	40	100	110	0	Open		AC
272	J1390	J1400	70	100	110	0	Open		AC
273	J1390	J1410	70	100	110	0	Open		AC
274	J1410	J1340	150	100	110	0	Open		AC
275	J1400	J1410	120	100	110	0	Open		AC
276	J1320	J1330	150	150	110	0	Open	:1949	CI
277	J1330	J1340	120	150	110	0	Open	:1949	CI
278	J1320	J1360	30	150	110	0	Open		CI
279	J1360	J1370	80	100	110	0	Open		AC
280	J1330	J1370	1000	100	110	0	Open		AC
281	J1320	J1350	240	150	110	0	Open	:1949	CI
282	J1360	J1420	120	150	110	0	Open		AC
283	J1420	J1430	40	150	110	0	Open		AC
284	J1420	J1450	100	150	110	0	Open		AC
285	J1430	J1440	50	100	110	0	Open		AC
286	J1350	J1460	100	150	110	0	Open	:1949	CI
287	J1460	J1450	90	150	110	0	Open	:1949	CI
288	J1250	J1470	30	150	110	0	Open		CI
289	J1470	J1490	100	100	110	0	Open		AC
290	J1480	J2910	70	150	110	0	Open	:1949	CI
291	J1370	J1440	150	100	110	0	Open		AC
292	J1430	J1440	1000	100	110	0	Open		AC
293	J1430	J1250	90	150	110	0	Open		AC
294	J1490	J1480	70	100	110	0	Open		AC
295	J1250	J1500	150	100	110	0	Open		AC
296	J1500	J1220	120	100	110	0	Open		AC
297	J1510	J1520	60	300	110	0	Open	:1949	CI

ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
298	J1520	J1530	160	300	110	0	Open	:1949	CI
299	J1530	J150	120	300	110	0	Open	:1949	CI
300	J1340	J1540	1000	100	110	0	Open	:	CI
301	J1540	J1520	120	100	110	0	Open	:	CI
302	J1540	J1550	220	100	110	0	Open	:	CI
303	J1530	J1550	150	100	110	0	Open	:	CI
304	J1550	J1560	20	100	110	0	Open	:	CI
305	J1560	J1570	50	100	110	0	Open	:	CI
306	J1570	J1210	50	150	110	0	Open	:1949	CI
307	J1440	J1590	40	100	110	0	Open	:	AC
308	J1590	J1560	150	100	110	0	Open	:	AC
309	J1590	J1580	100	100	110	0	Open	:	AC
310	J1580	J1470	100	150	110	0	Open	:1949	CI
311	J1610	J180	150	150	110	0	Open	:1949	CI
312	J1600	J1610	1000	150	110	0	Closed	:	AC
313	J1450	J1620	250	150	110	0	Open	:1949	CI
314	J1620	J1610	100	150	110	0	Open	:1949	CI
315	J1460	J1620	250	100	110	0	Open	:	AC
316	J200	J1260	160	150	110	0	Open	:1949	CI
317	J1260	J1240	300	150	110	0	Open	:1949	CI
318	J1180	J1700	350	150	110	0	Open	:	AC
319	J1180	J1670	120	150	110	0	Open	:	AC
320	J1170	J1630	150	150	110	0	Open	:1949	CI
321	J1160	J1630	90	150	110	0	Open	:1950	CI
322	J1630	J1640	120	150	110	0	Open	:1950	CI
323	J1640	J1650	70	150	110	0	Open	:1950	CI
324	J1650	J1680	150	150	110	0	Open	:1950	CI
325	J1650	J1670	140	100	110	0	Open	:	AC
326	J1660	J1650	270	100	110	0	Open	:	AC
327	J1510	J1660	200	75	110	0	Open	:	AC
328	J1670	J1710	50	150	110	0	Open	:	AC
329	J1710	J1720	50	100	110	0	Open	:	AC
330	J1720	J1770	150	100	110	0	Open	:	AC
331	J1770	J1760	200	100	110	0	Open	:	AC
332	J1720	J1740	100	100	110	0	Open	:	AC
333	J1740	J1730	250	100	110	0	Open	:	AC
334	J1770	J1730	150	100	110	0	Open	:	AC
335	J1710	J1680	120	100	110	0	Open	:	AC
336	J1680	J1750	30	100	110	0	Open	:	AC
337	J1750	J1690	400	100	110	0	Open	:	AC
338	J1750	J1780	100	100	110	0	Open	:	AC
339	J1260	J1350	100	150	110	0	Open	:1949	CI
340	J1790	J165	50	100	110	0	Open	:	AC
341	J1790	J1800	200	100	110	0	Open	:	AC
342	J180	J1800	150	150	110	0	Open	:1949	CI
343	J1810	J1880	170	100	110	0	Open	:1950	CI
344	J1810	J1820	360	100	110	0	Open	:	AC
345	J1820	J230	100	200	110	0	Open	:1950	CI
346	J1300	J1830	200	100	110	0	Open	:	AC
347	J1880	J1890	150	100	110	0	Open	:1950	CI
348	J1880	J1860	200	100	110	0	Open	:	AC
349	J270	J1900	280	150	110	0	Open	:	CI
350	J240	J1930	100	150	110	0	Open	:1970	AC
351	J1910	J1930	250	150	110	0	Open	:	AC
352	J1930	J1940	350	150	110	0	Open	:	AC
353	J250	J1840	50	150	110	0	Open	:1970	AC
354	J1840	J1850	400	150	110	0	Open	:1970	AC
355	J240	J1950	300	150	110	0	Open	:	CI
356	J1840	J1960	280	150	110	0	Open	:1970	AC
357	J1870	J1970	300	100	110	0	Open	:1950	CI
358	J280	J1990	80	200	110	0	Open	:1950	CI
359	J1990	J1820	300	200	110	0	Open	:1950	CI
360	J2020	J2010	40	100	110	0	Open	:	AC

;ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
361	J2010	J420	350	100	110	0	Closed		AC
362	J1980	J2010	600	75	110	0	Open		AC
363	J2020	J2050	50	100	110	0	Open		AC
364	J2050	J2030	700	75	110	0	Open		AC
365	J2050	J2040	750	75	110	0	Open		AC
366	J280	J2080	200	100	110	0	Open		AC
367	J530	J2100	500	75	110	0	Open	;1970	AC
368	J2100	J2060	60	75	110	0	Open		AC
369	J2060	J2040	200	75	110	0	Open	;1975	AC
370	J2040	J2030	200	75	110	0	Open	;1975	AC
371	J2030	J2090	400	100	110	0	Open		AC
372	J2090	J2170	600	100	110	0	Open		AC
373	J2070	J2110	70	150	110	0	Open		AC
374	J2110	J2120	150	150	110	0	Open		AC
375	J2120	J2140	120	150	110	0	Open		AC
376	J2140	J2150	250	150	110	0	Open		AC
377	J2120	J2130	1000	100	110	0	Open		AC
378	J2130	J2160	250	100	110	0	Open		AC
379	J2090	J2130	80	75	110	0	Open		AC
380	J520	J2170	50	150	110	0	Open		AC
381	J2170	T11	50	150	110	0	Open		AC
382	J68	J520	50	60	110	0	Open		PE
383	J70	T12	1	1000	110	0	Open		
384	J2170	J2210	20	150	110	0	Open		AC
385	T12	J2210	30	150	110	0	CV		AC
386	J520	J2070	350	150	110	0	Open	;1951	AC
387	J34	J2180	200	110	110	0	Open		PVC
388	J2230	J520	270	200	110	0	Open	;1970	AC
389	J2230	J2100	850	75	110	0	Open		AC
390	J1920	J2260	500	100	110	0	Open		CI
391	J2250	J300	350	100	110	0	Open		PVC
392	J2250	J1920	350	100	110	0	Open		PVC
393	J2270	J380	150	200	110	0	Open	;1950	AC
394	J1050	J2280	600	225	110	0	Open	;1950	CI
395	J2280	J2270	300	100	110	0	Open	;1950	CI
396	J2300	J2270	400	200	110	0	Open	;1950	AC
397	J510	J2310	650	100	110	0	Open		AC
398	J370	J2310	50	100	110	0	Closed		AC
399	J550	J410	500	100	110	0	Open		AC
400	J420	J2060	800	75	110	0	Open	;1976	AC
401	J2320	J2330	150	150	110	0	Open		AC
402	J2320	J450	200	150	110	0	Open		AC
403	J2330	J460	300	150	110	0	Open		AC
404	J2330	J2340	250	100	110	0	Open		AC
405	J34	J2390	300	160	110	0	Open		PVC
406	J2390	J2400	500	110	110	0	Open		PVC
407	J2400	J2370	550	100	110	0	Open		GS
408	J2370	J2360	1000	75	110	0	Open		AC
409	J2360	J530	1000	75	110	0	Open		AC
410	J2380	J2230	550	200	110	0	Open	;1970	AC
411	J2380	J2360	1100	110	110	0	Open		PVC
412	J720	J2350	700	200	110	0	Open	;1970	AC
413	J720	J2410	600	100	110	0	Open		AC
414	J71	J2450	1000	160	110	0	CV		PVC
415	J2450	J2460	1200	160	110	0	Open	;2000	PVC
416	J2460	J2420	200	160	110	0	Open	;2000	PVC
417	J2420	J2470	400	110	110	0	Open		PVC
418	J2420	J2430	200	110	110	0	Open	;2000	PVC
419	J2470	J2410	10	110	110	0	Open		PVC
420	J2480	J610	700	200	110	0	Open	;1970	AC
421	J2240	J590	1700	50	110	0	Open		GS
422	J2490	J580	700	110	110	0	Open		PVC
423	J2490	J570	600	100	110	0	Open		AC

ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
424	J2500	J2510	250	160	110	0	Open	;1993	PVC
425	J2480	J2550	400	160	110	0	Open	;1993	PVC
426	J2510	J2520	200	160	110	0	Open	;1993	PVC
427	J2520	J2530	250	160	110	0	Open	;1993	PVC
428	J2550	J2540	250	160	110	0	Open	;1993	PVC
429	J2510	J2540	280	160	110	0	Open	;1993	PVC
430	J2540	J2530	150	160	110	0	Open	;1993	PVC
431	J2550	J2560	900	160	110	0	Open	;1993	PVC
432	J2520	J2570	600	110	110	0	Open	;1993	PVC
433	J730	J2560	250	200	110	0	Open	;1970	AC
434	J2580	J630	1400	200	110	0	Open	;1970	AC
435	J730	J2590	150	200	110	0	Open	;1970	AC
436	J2590	J2580	850	110	110	0	Open	;	PVC
437	J72	J73	1000	110	110	0	CV	;	PVC
438	J74	T13	1	1000	110	0	Open	;	
439	J72	J740	100	110	110	0	Closed	;	PVC
440	T13	T14	50	110	110	0	CV	;	PVC
441	J740	J2670	100	160	110	0	Open	;	PVC
442	J75	J2670	100	200	110	0	CV	;	PVC
443	J630	J2610	450	160	110	0	Open	;	
444	J2610	J2620	300	160	110	0	Open	;	PVC
445	J2620	J2680	600	160	110	0	Open	;	PVC
446	J2620	J2710	600	160	110	0	Open	;	PVC
447	J2680	J2690	300	160	110	0	Open	;	PVC
448	J2690	J2700	80	160	110	0	Open	;	PVC
449	J2700	J2930	450	160	110	0	Open	;	PVC
450	J2680	J2730	500	110	110	0	Open	;	PVC
460	J2690	J2720	300	110	110	0	Open	;	PVC
470	J2700	J2740	600	110	110	0	Open	;	PVC
471	J2750	J640	400	100	110	0	Open	;	AC
472	J39	J2760	50	100	110	0	CV	;	
473	J2760	J2770	900	160	110	0	Open	;	PVC
474	J660	J2780	1400	110	110	0	Open	;	PVC
475	J750	J2790	500	100	110	0	Open	;	AC
476	J2790	J2800	1000	100	110	0	Open	;	PVC
477	J780	J2810	5000	100	110	0	Open	;	AC
478	J2980	J2820	1500	100	110	0	Open	;	AC
57	J2440	J2830	1500	200	110	0	Open	;	AC
58	J32	J2840	1200	100	110	0	Open	;	AC
59	J2840	J2850	2700	100	110	0	Open	;	AC
60	J59	J58	10	150	110	0	CV	;	
61	J60	J58	10	150	110	0	CV	;	
62	S1	J61	1	1000	110	0	Open	;	
63	S2	J62	1	1000	110	0	Open	;	
479	J2860	J2870	800	110	110	0	Open	;	PVC
480	J2870	J57	1250	110	110	0	Open	;	PVC
56	J500	J63	150	300	110	0	Closed	;1954	AC
65	J63	T6	100	300	110	0	Closed	;	AC
66	J63	T9	100	300	110	0	Closed	;	AC
67	J47	J64	3.5	525	110	0	Open	;	CI
68	J65	J48	3.5	300	110	0	Open	;	CI
69	J66	J4	500	200	110	0	Open	;	
70	J2900	J2460	200	160	110	0	Open	;	PVC
481	T15	J2900	100	160	110	0	CV	;	PVC
482	J2910	J1230	60	150	110	0	Open	;1949	CI
483	J1190	J2910	120	100	110	0	Open	;	CI
71	J1490	J1500	120	100	110	0	Open	;	AC
72	J1620	J180	200	100	110	0	Open	;	AC
64	J2290	J1100	150	100	110	0	Open	;	AC
484	J895	J890	1200	150	110	0	Open	;	AC
485	J905	J910	1000	75	110	0	Open	;	PE
73	J890	J885	200	150	110	0	Open	;	AC
74	J885	J2940	500	90	110	0	Open	;	AC

;ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
75	J67	J868	50	100	110	0	CV	;	
486	J868	J870	200	150	110	0	Open	;	AC
487	J868	J867	300	150	110	0	Open	;	AC
488	J867	J865	1000	150	110	0	Open	;	AC
489	J2870	J2950	1000	100	110	0	Open	;	
490	J2950	J2960	500	100	110	0	Open	;	
76	J995	J990	10	75	110	0	Open	;	PE
77	J650	J660	500	200	110	0	Open	;	AC
78	J770	J2970	10	150	110	0	Open	;	AC
79	J2810	J2980	1500	100	110	0	Open	;	AC
80	J790	J2990	10	150	110	0	Open	;	
81	J3000	J3010	10	150	110	0	Open	;	
82	J3010	J2970	1000	150	110	0	Open	;	AC
83	J8	J1020	1000	200	110	0	Open	;	AC
491	J2180	J2220	400	110	110	0	Open	;	PVC
84	J2190	J560	500	100	110	0	Open	;	AC
85	J57	J2200	500	100	110	0	Open	;	AC
86	J32	J2440	2500	200	110	0	Open	1994	PVC
492	J770	J2630	700	100	110	0	Open	;	
87	J40	J41	300	75	110	0	CV	;	PE
88	J76	J77	500	110	110	0	Open	;	
89	J78	T11	1	1000	110	0	Open	;	
90	J79	J2230	300	110	110	0	CV	;	
91	J28	J32	500	200	110	0	Open	;	
92	J11	J24	600	300	110	0	Closed	;	AC
93	J80	J2860	100	150	110	0	Open	;	
94	J64	J81	3.5	525	110	0	Open	;	CI
95	J82	J65	3.5	300	110	0	Open	;	CI
96	J30	J28	10	200	110	0	CV	;	
1000	N3	J10000	400	150	110	0	Open	;	DI
1001	N5	J10000	300	150	110	0	Closed	;	DI
1002	J10000	J10010	200	150	110	0	Open	;	DI
1003	N4	J10010	20	150	110	0	Open	;	DI
1004	J10010	T100	1000	200	110	0	Open	;	DI
1005	N8	J10020	200	150	110	0	Open	;	DI
1006	N6	J10020	30	150	110	0	Open	;	DI
1007	J10020	J10030	400	200	110	0	Open	;	DI
1008	N7	J10030	30	150	110	0	Open	;	DI
1009	J10030	J10040	1500	250	110	0	Open	;	DI
1010	N9	J10040	1000	200	110	0	Open	;	
1011	J10040	J10050	1300	300	110	0	Open	;	DI
1012	J10050	J10060	1000	400	110	0	Open	;	DI
1013	N11	J10060	1100	200	110	0	Open	;	DI
1014	N13	J22	200	150	110	0	Open	;	DI
1015	J22	J10080	200	250	110	0	Open	;	DI
97	J15	J10080	10	200	110	0	CV	;	
1016	J10080	J10090	100	250	110	0	Open	;	DI
1017	J10090	J10100	100	300	110	0	Open	;	DI
1018	J10100	J10070	400	350	110	0	Open	;	
1019	J10060	J10070	600	400	110	0	Open	;	DI
1020	J10070	J11	2200	600	110	0	Open	;	DI
1021	N10	J10110	1600	150	110	0	Open	;	
1022	N12	J10120	900	150	110	0	Open	;	
1023	J29	J10120	3000	300	110	0	Open	;	
1024	J10120	J10110	700	300	110	0	Open	;	
1025	N11	J10110	500	200	110	0	Closed	;	DI
1026	J10110	T101	2000	400	110	0	Open	;	DI
2000	T101	J20000	500	400	110	0	CV	;	DI
1028	J10060	J1020	20	300	110	0	Open	;	DI
1029	J11	J16	20	600	110	0	Open	;	DI
1030	J16	J19	500	600	110	0	Open	;	DI
2001	T102	J20010	20	700	110	0	CV	;	DI
2002	T1	J20010	20	700	110	0	CV	;	DI

;ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
2003	J20010	J20020	500	700	110	0	Open	;	DI
2004	T103	J20020	20	500	110	0	CV	;	DI
2005	J20020	J20030	200	700	110	0	Open	;	DI
2006	T2	J20030	20	300	110	0	Open	;	
1031	T10	T100	500	200	110	0	CV	;	PVC
2007	T100	J20040	10	300	110	0	CV	;	
2008	J20040	J20050	400	300	110	0	Open	;	DI
2009	J20050	J20060	600	300	110	0	Open	;	DI
2010	J20070	J20080	2400	300	110	0	Open	;	DI
2011	J20080	J860	10	200	110	0	Open	;	PVC
2012	J20030	J20090	800	700	110	0	Open	;	DI
2013	J20100	J20110	450	700	110	0	Open	;	DI
2014	J20670	J20120	800	400	110	0	Open	;	DI
2015	J20120	J20130	600	400	110	0	Open	;	DI
2016	J20130	J20140	1000	400	110	0	Open	;	DI
2017	J20150	J63	50	400	110	0	Closed	;	PVC
2018	J20100	J590	20	200	110	0	Open	;	
2019	J20110	J700	10	300	110	0	Open	;	
2020	J20120	J560	10	200	110	0	Open	;	
2021	J20130	J2310	10	200	110	0	Open	;	
2022	J20140	J500	10	200	110	0	Open	;	
2023	J20110	J20160	1000	300	110	0	Open	;	DI
2024	J20160	J20170	1250	300	110	0	Open	;	DI
2025	J20170	J20180	800	300	110	0	Open	;	
2026	J20180	J20190	700	300	110	0	Open	;	
2027	J20190	J20200	500	300	110	0	Closed	;	
2028	J20200	J20210	700	200	110	0	Closed	;	
2029	J20160	J57	10	200	110	0	Open	;	PVC
2030	J20170	J2870	10	200	110	0	Open	;	
2031	J20180	J2860	10	200	110	0	Open	;	
2032	J20200	J820	10	200	110	0	Closed	;	
2033	J20210	J830	10	200	110	0	Closed	;	
2034	J20110	J20220	500	400	110	0	Open	;	DI
2035	J20220	J20230	1000	400	110	0	Open	;	DI
2036	J20230	J20240	650	400	110	0	Open	;	DI
2037	J20240	J20250	1500	400	110	0	Open	;	DI
2038	J20250	J20260	1200	400	110	0	Open	;	DI
2039	J20220	J710	10	200	110	0	Open	;	
2040	J20230	J610	20	400	110	0	Open	;	
2041	J20240	J620	10	200	110	0	Open	;	
2042	J20250	J630	10	200	110	0	Open	;	
2043	J20260	J660	10	400	110	0	Open	;	DI
2044	J20000	J20270	600	400	110	0	Open	;	DI
2045	J20270	J20280	700	400	110	0	Open	;	DI
2046	J20280	J20290	900	400	110	0	Open	;	DI
2047	J20290	J20310	800	400	110	0	Open	;	DI
2048	J20300	J20310	1400	400	110	0	Closed	;	DI
2049	J20310	J20320	500	400	110	0	Open	;	DI
2050	J20270	J2570	10	200	110	0	Open	;	
2051	J20280	J2540	100	200	110	0	Open	;	PVC
2052	J20300	J2440	100	200	110	0	Closed	;	
2053	J20310	J2560	10	200	110	0	Open	;	
2054	J20320	J610	10	200	110	0	Open	;	
2055	J20320	J20230	50	400	110	0	Open	;	DI
2056	J20140	J20330	100	250	110	0	Closed	;	
2057	J54	J20330	300	250	110	0	Closed	;	
2058	J20330	J20340	200	250	110	0	Closed	;	
2059	J20340	J20350	700	250	110	0	Closed	;	
2060	J20350	J20360	900	250	110	0	Closed	;	PVC
2061	J20360	J20190	600	250	110	0	Closed	;	PVC
2062	J20340	J470	10	200	110	0	Closed	;	PVC
2063	J20350	J800	10	200	110	0	Closed	;	PVC
2064	J20360	J810	10	200	110	0	Closed	;	PVC

;ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
2065	J20230	J20370	650	400	110	0	Closed	;	DI
2066	J20370	J20380	800	400	110	0	Closed	;	DI
2067	J20380	J20390	450	400	110	0	Closed	;	DI
2068	J20390	J20400	300	400	110	0	Closed	;	DI
2069	J20400	J20130	300	400	110	0	Closed	;	DI
2070	J20370	J540	10	200	110	0	Closed	;	PVC
2071	J20380	J450	10	200	110	0	Closed	;	PVC
2072	J20390	J410	10	200	110	0	Closed	;	PVC
2073	J20400	J400	10	200	110	0	Closed	;	PVC
2074	J20260	J20410	500	300	110	0	Closed	;	DI
2075	J20410	J20420	1000	300	110	0	Closed	;	DI
2076	J20420	J20430	1200	300	110	0	Closed	;	DI
2077	J20430	J20440	350	300	110	0	Closed	;	DI
2078	J20440	J20450	300	300	110	0	Closed	;	DI
2079	J20410	J650	10	200	110	0	Open	;	PVC
2080	J20420	J760	10	200	110	0	Closed	;	PVC
2081	J20430	J2210	10	200	110	0	Closed	;	PVC
2082	J20440	J2070	20	200	110	0	Closed	;	PVC
2083	J20450	J2090	20	200	110	0	Closed	;	PVC
2084	J20380	J20460	350	300	110	0	Closed	;	DI
2085	J20460	J20470	700	300	110	0	Closed	;	DI
2086	J20470	J20480	400	300	110	0	Closed	;	DI
2087	J20480	J20450	400	300	110	0	Closed	;	DI
2088	J20460	J430	10	200	110	0	Closed	;	PVC
2089	J20470	J2060	10	200	110	0	Closed	;	PVC
2090	J20480	J2030	10	200	110	0	Closed	;	PVC
2091	J1060	J20490	20	300	110	0	Closed	;	DI
2092	J20490	J20500	600	300	110	0	Closed	;	DI
2093	J20500	J20510	500	300	110	0	Closed	;	DI
2094	J20510	J20520	350	300	110	0	Closed	;	DI
2095	J20520	J20530	400	300	110	0	Closed	;	DI
2096	J20530	J20540	300	300	110	0	Closed	;	DI
2097	J20540	J20550	400	300	110	0	Closed	;	DI
2098	J20550	J20560	700	200	110	0	Closed	;	PVC
2099	J20560	J20570	450	200	110	0	Closed	;	PVC
2100	J20570	J20580	150	200	110	0	Closed	;	PVC
2101	J20580	J20590	400	200	110	0	Closed	;	PVC
2102	J20590	J20600	150	200	110	0	Closed	;	PVC
2103	J20600	J20610	350	200	110	0	Closed	;	PVC
2104	J20610	J20620	300	200	110	0	Closed	;	PVC
2105	J20620	J20630	300	200	110	0	Closed	;	PVC
2106	J20630	J20500	200	200	110	0	Closed	;	PVC
2107	J20610	J20640	600	200	110	0	Closed	;	PVC
2108	J20510	J1180	30	200	110	0	Open	;	PVC
2109	J20520	J1170	20	200	110	0	Closed	;	PVC
2110	J20520	J1140	50	200	110	0	Closed	;	PVC
2111	J20530	J1310	10	200	110	0	Closed	;	PVC
2112	J20540	J210	10	200	110	0	Closed	;	PVC
2113	J20550	J190	10	200	110	0	Closed	;	PVC
2114	J20560	J230	10	200	110	0	Closed	;	PVC
2115	J20570	J2000	10	200	110	0	Closed	;	PVC
2116	J20580	J1990	10	200	110	0	Closed	;	PVC
2117	J20590	J1890	10	200	110	0	Closed	;	PVC
2118	J20600	J270	10	200	110	0	Closed	;	PVC
2119	J20610	J1840	20	200	110	0	Closed	;	PVC
2120	J20610	J1930	20	200	110	0	Closed	;	PVC
2121	J20620	J1910	20	200	110	0	Open	;	PVC
2122	J20630	J1110	10	200	110	0	Closed	;	PVC
2123	J20640	J310	20	200	110	0	Closed	;	PVC
2124	J20640	J320	20	200	110	0	Closed	;	PVC
2125	J20570	J20650	300	200	110	0	Closed	;	PVC
2126	J20650	J20660	200	200	110	0	Closed	;	PVC
2127	J20660	J20450	100	300	110	0	Closed	;	DI

;ID	Node1	Node2	Length (m)	Diameter (mm)	Roughness	MinorLoss	Status	Year laid	Material
2128	J20140	J490	100	200	110	0	Open	;	PVC
2129	J510	J2880	100	100	110	0	Open	;	PVC
2130	J20110	J20670	500	400	110	0	Open	;	DI
2131	J20670	J570	20	200			Open	;	PVC
2132	J20100	J600	20	200			Open	;	PVC
2133	J20190	J820	100	200			Open	;	PVC

ポンプデータ

;ID	Node1	Node2	Parameters	Place	Q (m ³ /d)	Pump Head (m)
P1	J61	J59	HEAD C1	;Bububu Booster1	1,320	85
P2	J62	J80	HEAD C2	;Mtoni Booster	240	26
P3	S3	J3	HEAD C3	;Dimani cave	1,440	70
P4	S4	J6	HEAD C4	;Kianga	1,920	100
P5	S5	J13	HEAD C5	;M.Mchomeke	1,104	78
P6	S6	J14	HEAD C6	;M.Mchomeke	2,400	110
P7	S7	J15	HEAD C7	;M.Mchomeke	1,104	78
P8	S8	J18	HEAD C8	;M.Mchomeke	720	95
P9	S9	J21	HEAD C9	;M.Mchomeke	1,320	110
P10	S10	J23	HEAD C10	;Kianga	1,608	100
P11	S11	J26	HEAD C11	;Chunga	2,400	110
P12	S12	J30	HEAD C12	;Chunga	1,440	80
P13	S13	J31	HEAD C13	;Chunga	1,920	100
P14	S14	J33	HEAD C14	;K.Kikombe	720	80
P15	S15	J35	HEAD C15	;K.Kikombe	1,440	80
P16	S16	J36	HEAD C16	;K.Kikombe	960	80
P17	S17	J37	HEAD C17	;Mbweni	1,152	82
P18	S18	J39	HEAD C18	;Mbweni	168	43
P20	S20	J40	HEAD C20	;Dole	1,200	116
P21	S21	J42	HEAD C21	;Mfensini	720	85
P29	J47	J48	HEAD C29	;Saateni No.3	1,440	100
P19	S19	J56	HEAD C19	;Maungani	480	80
P31	T11	J68	HEAD C31	;Mbao Booster	240	40
P32	T11	J69	HEAD C32	;Mbao elevated tank	1,680	100
P22	S22	J71	HEAD C22	;Semuso	960	120
P23	S23	J72	HEAD C23	;Monbasa	120	80
P33	T14	J75	HEAD C33	;Monbasa Booster	48	70
P28	J61	J60	HEAD C28	;Bububu Booster2	576	80
P30	J64	J65	HEAD C30	;Saateni No.2	5,400	63
P24	S24	J66	HEAD C24	;Dimani	5,400	63
P25	S25	J67	HEAD C25	;Kitosani	120	40
P26	S26	J76	HEAD C26	;Mbao	120	40
P27	S27	J79	HEAD C27	;Migombani	240	40
P34	J560	T15	HEAD C34	;	400	50
P35	J81	J82	HEAD C35	;Saateni No.1	12,096	52

資料 8-2 社会状況調査

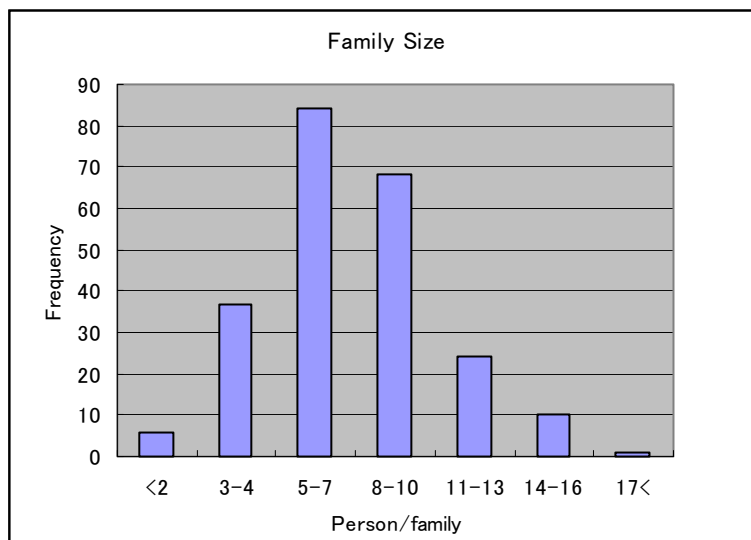
ザンジバルタウン住民の生活状況及び水道使用状況等を把握するため、同タウンの全 12 ゾーンから、ホテルを含む全 240 世帯/カ所を抽出し、調査票をもとに面接調査を行った。その概要を以下に示す。

なお、各ゾーンの職種別回答者数は下表のとおりであり、農業、商業、公務員、サービス業従事者が 70% を占める。

Zone	Agriculture	Civil servant	Commercial	Hotel	Industry	Fishery	Forests	Services	Tourism	Others	No answer	Total
1				3							17	20
2	4	7	6			1				2		20
3	6	3	4			1		4		2		20
4			7					3		1	9	20
5	11	1	2			4			2			20
6	11	5				3		1				20
7	2	8	9		1							20
8	16	1	2							1		20
9	7	3	3			1	1	4		1		20
10	14	2						3			1	20
11											20	20
12		3	3			1		11		1	1	20
Total	71	33	36	3	1	11	1	26	2	8	47	240

1. 家族構成

ホテル、モスク等を除いた一般家庭の一世帯当り居住者数は下図のとおり。大半が 5~10 人/世帯である。



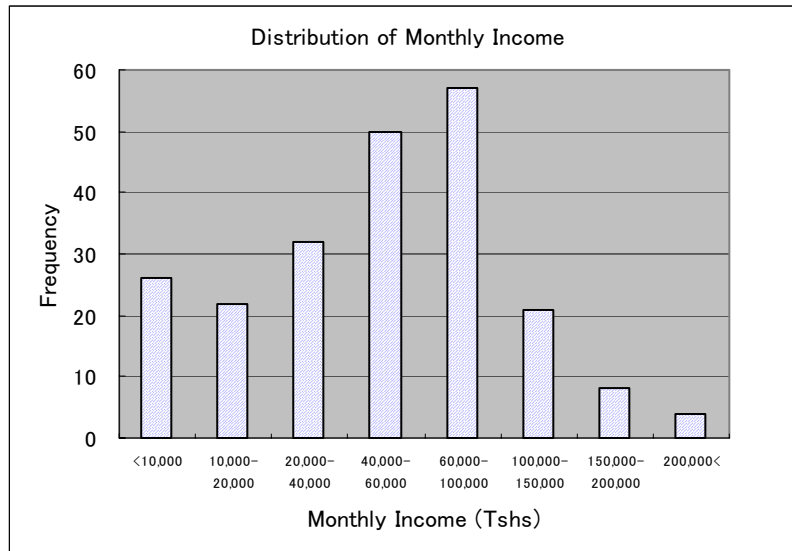
2. 収入と支出

(収入)

主要な職業別にみた 1 ヶ月当りの世帯収入、またホテル、モスク等を除く回答のあった世帯の 1 ヶ月あたり収入の分布を下表、及び下図にそれぞれ示す。 公務員、商業、サービス業従事者を中心に、1 月あたり 20,000~100,000 Tshs.の世帯が 60%以上を占めるが、全体では 2,000 Tshs.以下の世帯も 12%存在している。

Monthly Income (Tshs.)

Category	Minimum	Maximum	Average
Agriculture	6,000	250,000	44,000
Civil servants	23,000	170,000	74,000
Commercial	10,000	300,000	88,000
Fishery	5,800	133,000	41,000
Services	8,300	163,000	76,000

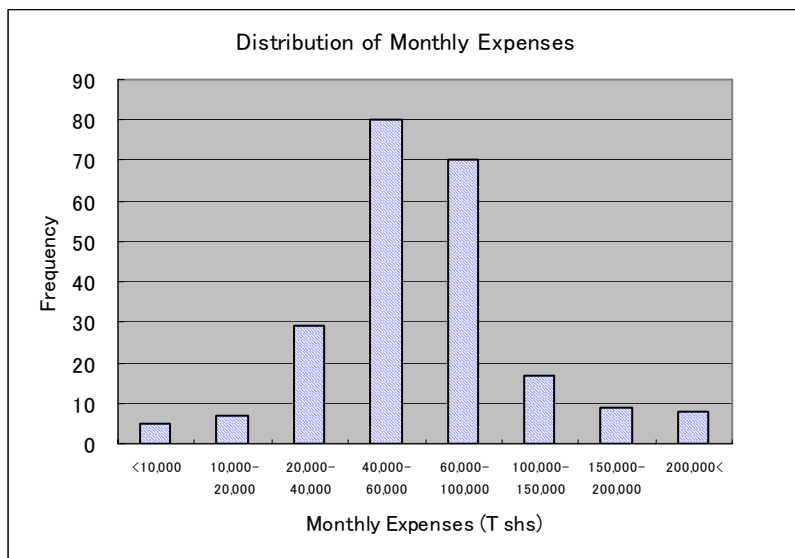


(支出)

同様に、主要な職業別一世帯あたりの 1 ヶ月あたり支出、またホテル、モスク等を除く回答のあった世帯の 1 ヶ月あたり支出の分布を下表、下図にそれぞれに示す。

Monthly Expense (Tshs.)

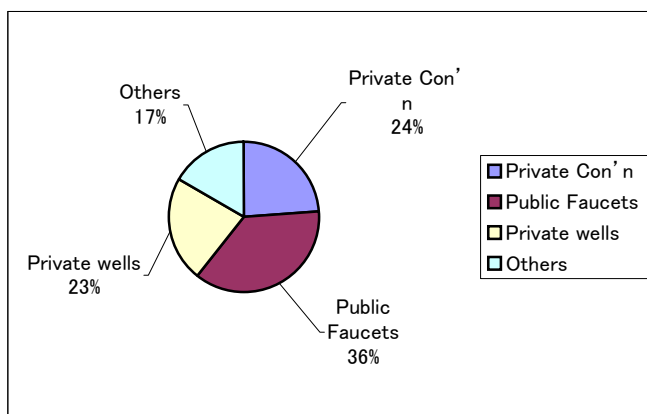
Category	Minimum	Maximum	Average
Agriculture	6,000	120,000	59,000
Civil servants	30,000	700,000	120,000
Commercial	3,000	300,000	80,000
Fishery	21,000	200,000	74,000
Services	45,000	160,000	89,000



3. 水道利用の現状

(水利用の形態)

住民が利用している給水施設は、下図に示すとおり、各戸給水栓が 24%、共同水栓が 36%を占めている。残る 30%は私有井戸や、その他 Mobile と呼ばれる水売りに依存している。



また、水汲みまでの距離は各戸給水を除いて、ほとんどが 50m以上となっている。この内の約半数が 100mを超えての水汲みとなっており、日常生活に相当の負担を強いられているようである。

Distance to Faucets	<50m	<100m	Farther than 100m	Total
Number	79	75	76	240
%	33%	31%	32%	100%

貯水タンク、ポンプの所有者数は下表に示すとおり、それぞれ 32、33 件であり、各戸給水を受けている家屋や私有井戸所有家屋の約 20%がこれらの設備を備えている。

Water Tanks	Yes	No	Total
Number	32	208	240
%	13	87	100%

Pump for Water Supply	Yes	No	Total
Number	33	207	240
%	13	87	100%

(給水時間、給水圧)

給水時間と給水圧については、下表に示すとおり、回答者の80%が現在の3～24時間の給水時間について満足しているようであるが、給水圧については大半が不十分であるとしている。

Service Time between 3-24 hrs.

Satisfied	Yes	No	Total
Number	192	48	240
%	80	20	100%

Service Pressure

Service Pressure	Sufficient	Insufficient	Total
Number	74	166	240
%	31	61	100%

(水質)

また、水質については下表に示すとおり、臭味について大半が問題なしとしている。特に着色水については全ての回答者から問題なしとされた。

Taste

Taste	Good	Fair	Bad	Total
Number	178	39	23	240
%	74	16	10	100%

Odour

Odour	Yes	No	Total
Number	92	148	240
%	38	62	100%

Colour

Colour	Yes	No	Total
Number	0	240	240
%	0	100	100%

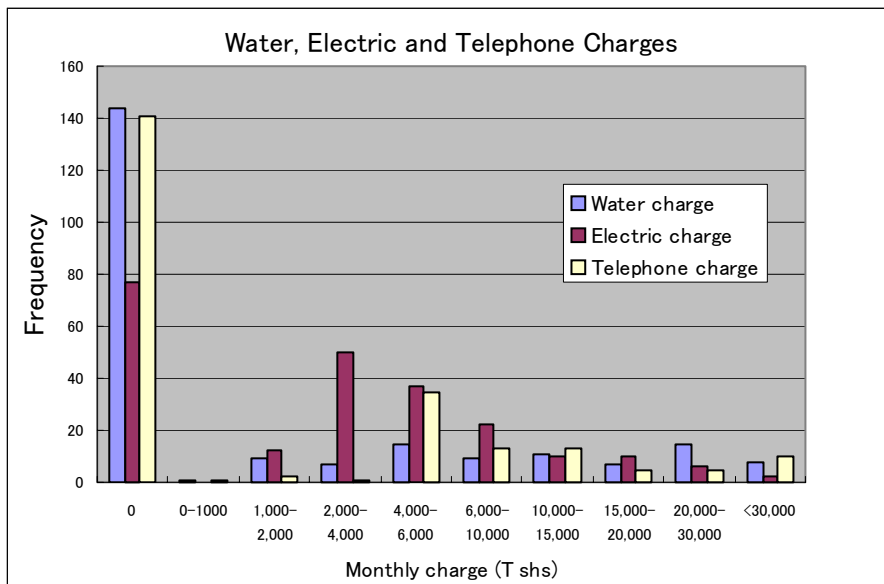
(給水改善に係る要望)

給水改善に係る要望では、下表に示すとおり、給水圧とともに修繕に係る改善要望が大半を占めている。

Request for Improvements	Pressure	Service Hrs	Quantity	Repair	Total
Number	121	29	29	61	240
%	50	12	12	26	100%

(水道料金)

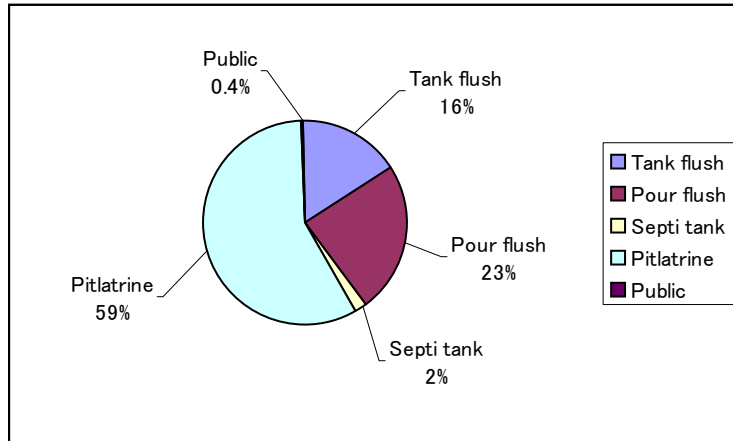
現在 DWD では、ホテルを除き、水道料金を徴収していないが、回答のあった住民の中には水道料金を支払っている者が約 60%存在する。これらは、水売り(Mobile)への水代や私有井戸やコミュニティ水道の共用に際し、ポンプの電気料金を賄うために必要となる料金である。一般家庭における水道料金は、下図に示すように、概ね 1,000~30,000 Tshs./月に亘っており、大きな開きがある。また同図に示すとおり、電気料金、及び電話料金より高額の支出となっている例もある。



4. 衛生状況

(トイレの設置状況)

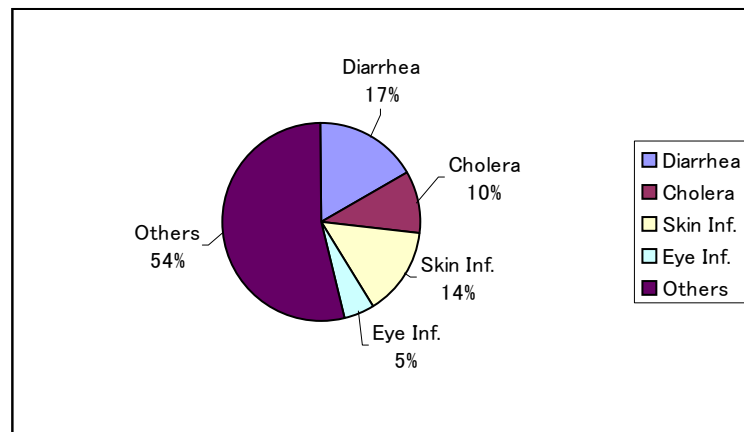
トイレの種別は、下図に示すとおり、フラッシュ式水洗トイレ、手酌式水洗トイレが約 40%、汲み取り式トイレが約 60%である。また、公衆トイレを除く全てが自宅内に設置されている。



Location	Indoor	Outdoor	Total
Number	239	1	240
%	99.5	0.5	100%

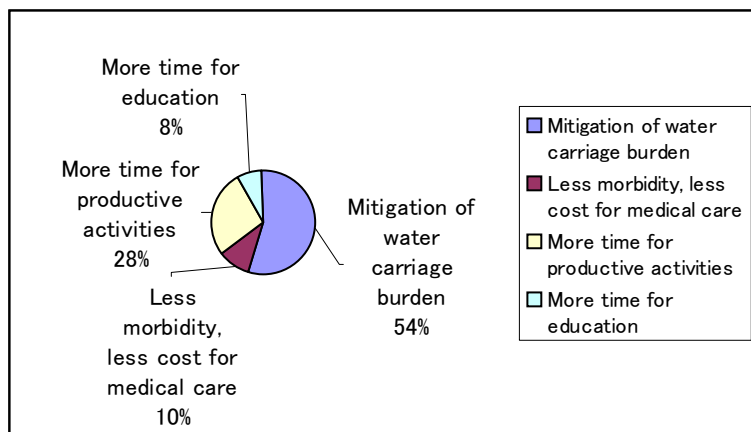
(感染症)

感染症については、下痢、コレラ、皮膚感染症、眼病が半数近くを占め、その他の感染症を含め、一人あたり年平均2～3回程度罹患しているようである。また、医療機関に支払う費用は1世帯あたり年平均12,000 Tshs.、医薬品には27,000 Tshs.支出しているようである。



(給水改善により期待される効果)

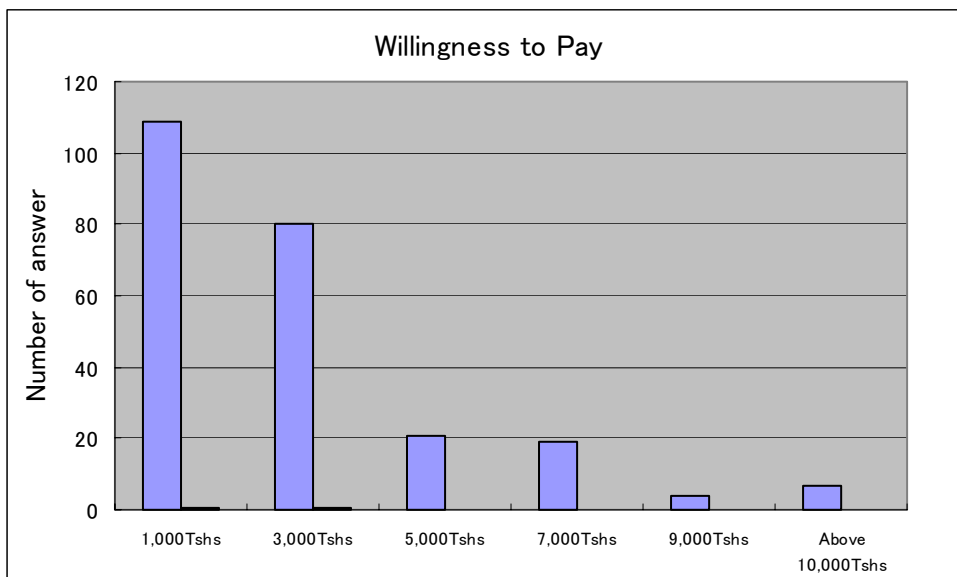
給水改善により期待される効果は下図に示すとおりであるが、最も期待される効果として、住民の水汲みに係る負担軽減を挙げている。



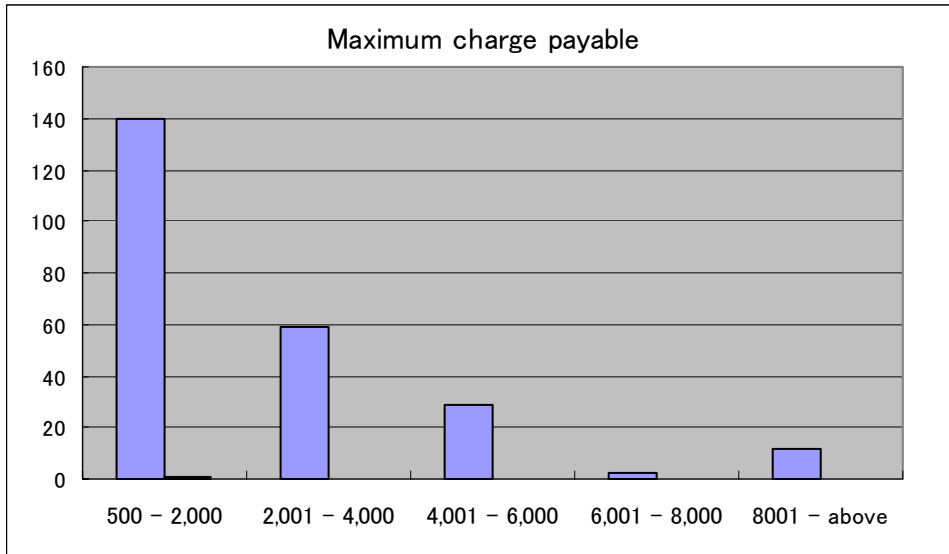
5. 水道料金支払いの意思、及び支払い可能額

水道料金の支払い意思に関する調査では、ほとんどの回答者から、給水事情が改善された場合においては、支払いの意思表があり、水道料金として月額 1,000~3,000 Tshs.程度を希望している。また、支払い能力としては約 60%の回答者が、月額最大 500~2,000 Tshs.を挙げている。また、2,000 Tshs.を超えた支払い能力のある回答者が 40%存在することから、今後の料金設定に関し参考となるものである。

(支払い意思)



(支払い可能額)



(水道改善への協力意思)

水道サービスの改善に対しては、全ての回答者から協力の意思表示があった。

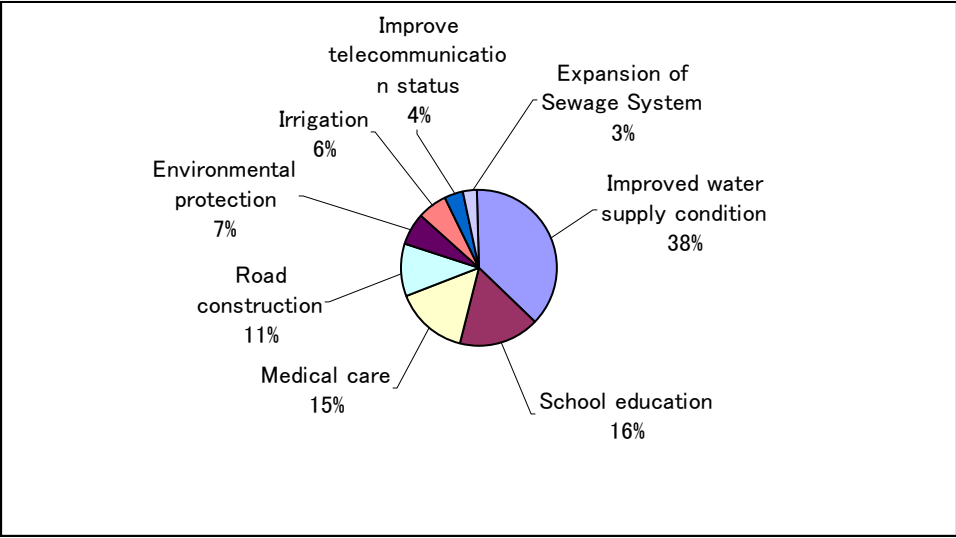
Cooperate for the Improvement of Water Service

Yes	No	Total
240	0	240
100%	0%	100%

6. 政府に対する要望等

政府が行うべき最優先施策に関しては、下表のように多岐に亘っているが、給水サービス改善を最優先とすべきとの回答が約 40%と最も多く、次いで学校教育、医療、道路建設となっている。

Items	No of Interviewer	%
Improved water supply condition	89	37%
School education	39	16%
Medical care	36	15%
Road construction	27	11%
Environmental protection	17	7%
Irrigation	15	6%
Improve telecommunication status	10	4%
Expansion of sewage system	7	3%
Total	240	100%



調査票

Socio-Economical Condition Survey Sheet

Survey Team: _____ Date: _____

1. Location

Survey Block: _____ Address: _____

Served by Pipe System: Yes / No Type of Housings: _____

2. Survey Items

(1) Outline of Survey Sites

1) General Households (Residents)

Family Component: _____

No. of Family Members: _____

2) Commercial / Industrial Area

Category: Commercial / Industrial / Services / Tourism

Area: _____ m²

3) Hotels

No. of Guests: _____ persons/Year

(2) Income

1) Annual Income: _____ Tshs, Agri. / Indus. / Comm. / Service / Tour. / Fish. / Forest.

2) Monthly Expense: _____ Tshs

3) Monthly Water Charge: _____ Tshs

4) Monthly Electricity Charges: _____ Tshs

5) Monthly Telephone Charges: _____ Tshs

(3) Access to potable water and its usage

1) Location of Faucets: In door / Out door / Communal / Public / Others ()

2) Frequency: _____ times/day (Dry Season) _____ time/day (Rainy Season)

3) Distance to Faucets: ≤ 50 m / < 100 m / Further ()

4) Water Source: Private Connection / Public Faucet / Private Well / Others ()

5) Do you use a water tank?: Yes / No

6) Do you use a pump for water supply?: Yes/No

(4) Water Supply Conditions and Requests

1) Service Time: _____ hours/day, Are you satisfied?: Yes / No

2) Service Pressure: Sufficient / Insufficient

3) Water Quality: Taste: Good / Fair / Bad, Odour: Yes / No, Colour: No / Yes

4) Request for improvement: Pressure (), Service Hours (), Quality (), Repair (), Others

(5) Toilet Facility

1) Location: Indoor / Outdoor / None

2) Type of Facility: Tank Flush / Pour Flush / Septic Tank / Pit Latrine / Public or Shared

(6) Morbidity of infectious disease

1) Type of infectious disease you encounter: diarrhoea, cholera, skin infection, eye infection, others

2) How many times your family member infected by the above: _____ times/year

3) Expense for medical care: _____ Tshs/Year/family

4) Expense for medicines: _____ Tshs/Year/family

(7) If piped water service improves, which effect do you most expect ?

1) Mitigation of water carriage burden ()

2) Less morbidity, less cost for medical care ()

3) More time can be spent for productive activities ()

4) More time can be sheared for Education ()

(8) How much do you pay for water ?

1) How much do you want to pay for improved water service: 1000, 3000, 5000, 7000, 9000 Tshs/month

2) Maximum monthly charge you can pay: _____ Tshs/month

(9) Do you cooperate if construction work is launched for improvement of water supply ?

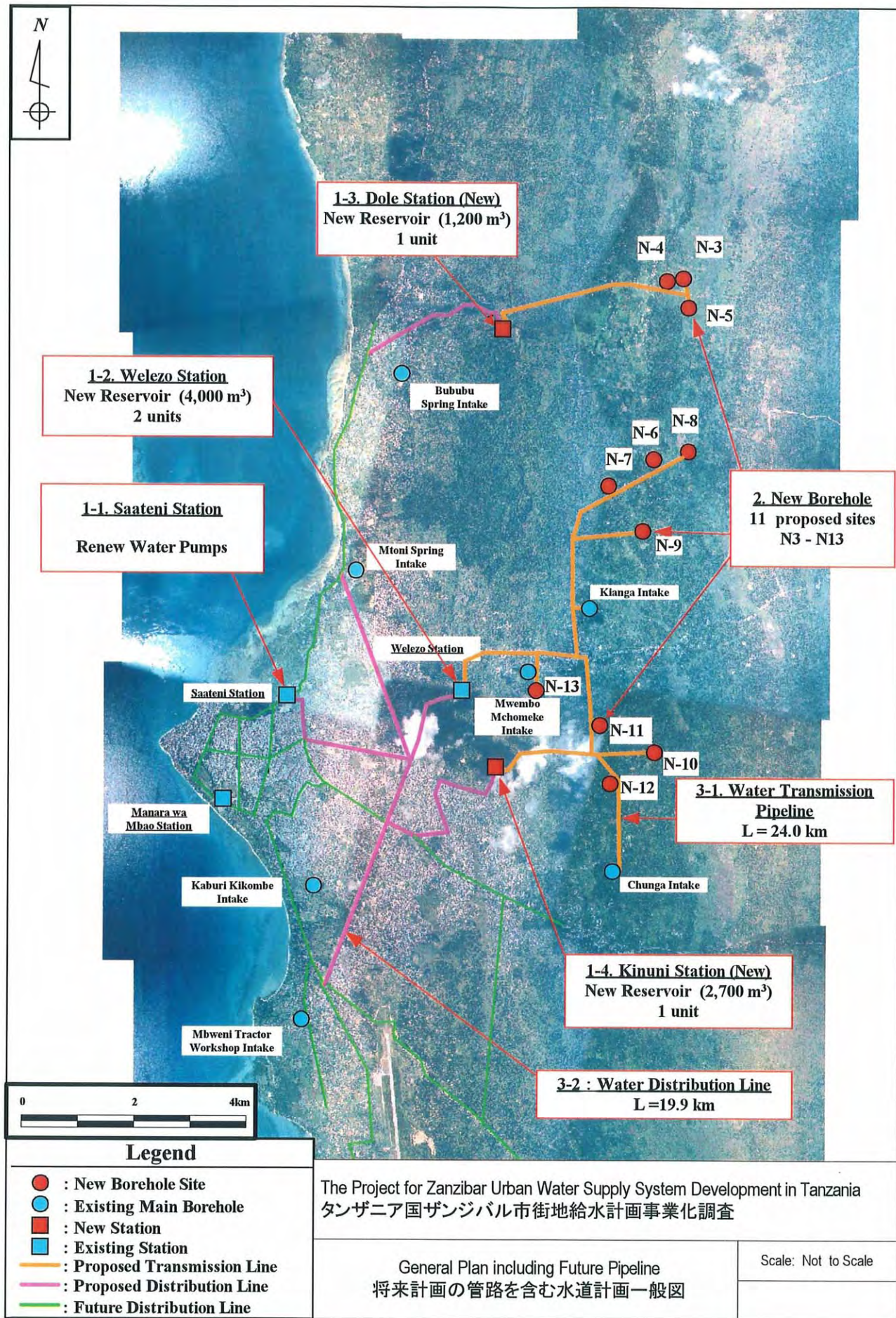
Yes / No / Object

(10) Prioritize the following items to be executed by the Government:

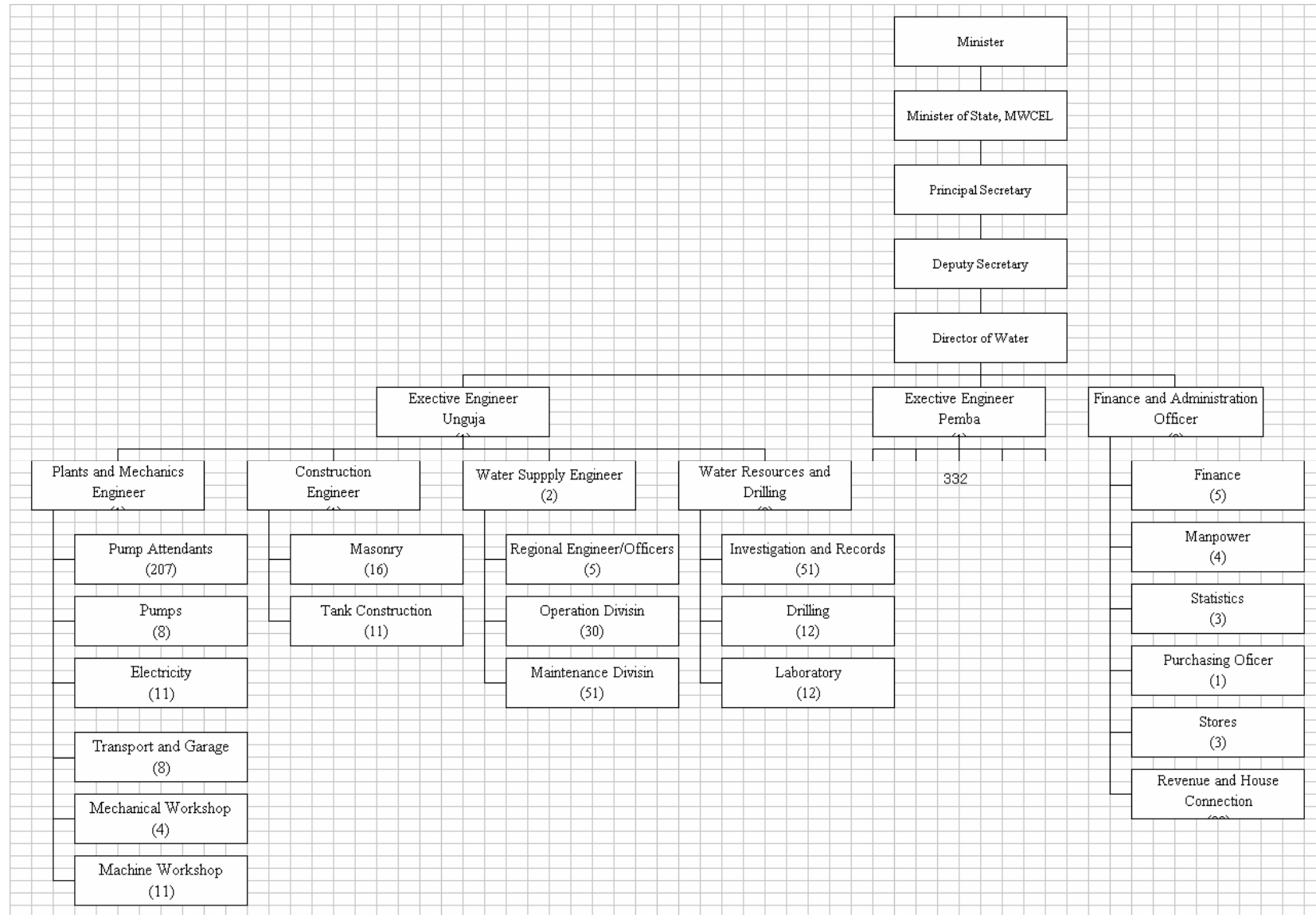
Improve in Water Supply Condition (), Expansion of Sewerage System ()

Road Construction (), School Education (), Improve of Telecommunication Status ()

Medical Cares (), Irrigation (), Environmental Protection ()



資料 8-4 (1) DWD 現行組織図



資料 8-4 (2) : 職能別人員表 1/2

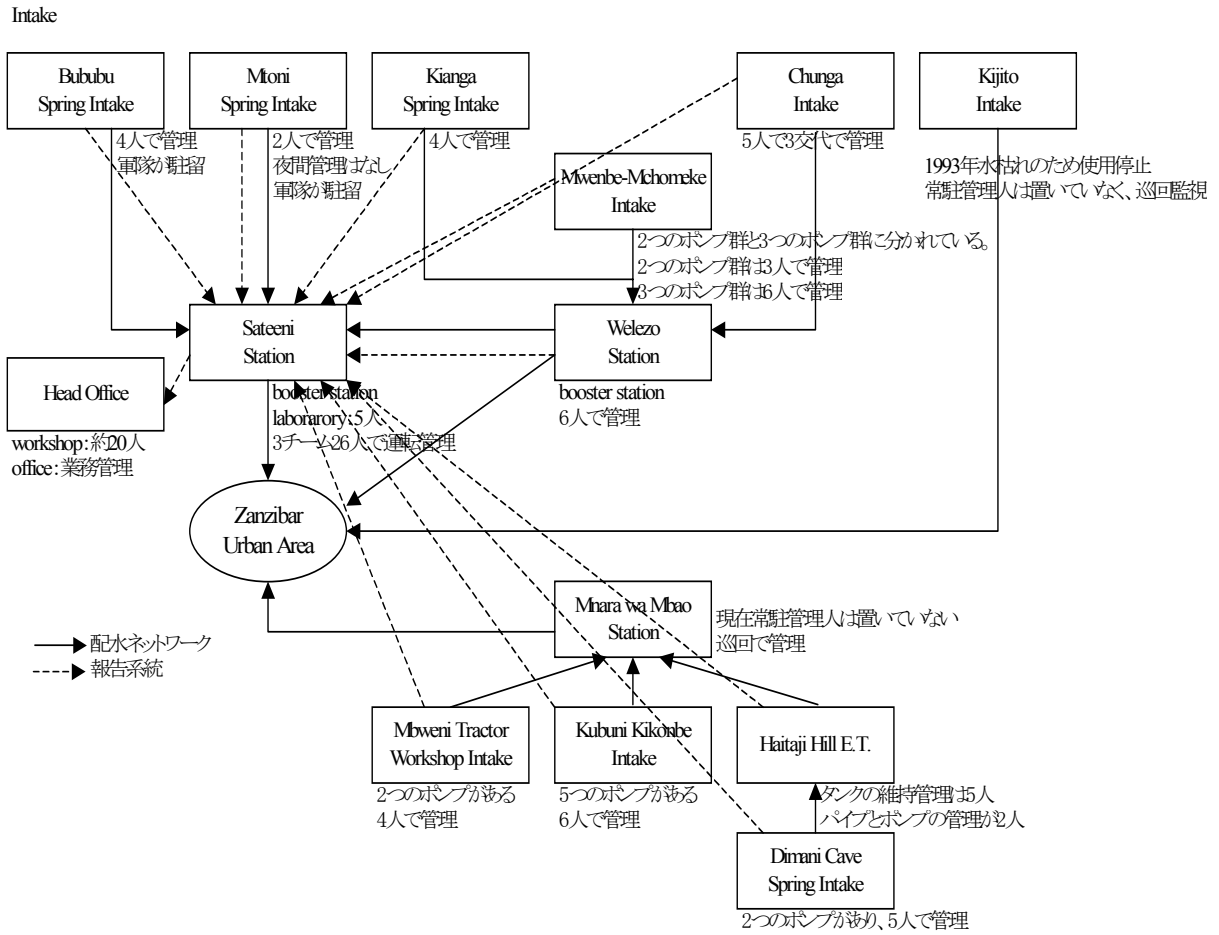
Personnel Allocation by Sector and Division of DWD

	Rank	Unguja	Pemba
1	Director	1	
2	Engineers	15	3
3	Administration	3	3
4	Cartographer	1	
5	Accounting	3	2
6	Office Supervisor	1	1
7	Revenue Officer	1	1
8	Revenue Clerk	5	2
9	Salary Clerk	4	1
10	Storekeeper	3	2
11	Purchase Officer	1	1
12	Head of Borehole Section	2	1
13	Registry Clerk	3	
14	Statistician	3	1
15	Regional Water Officer	2	2
16	District Water Officer	6	
17	Computer Operator	4	4
18	Laboratory Technician	3	
19	Water Technician	12	9
20	Drillers	10	4
21	Electrician	15	15
22	Fitters and Turners	9	1
23	Welder	6	
24	Mechanics	9	7
25	Operation and Maintenance	11	6
26	Driver	12	4
27	Civil Technician	5	3
28	Masonry	11	8
29	Carpentry	16	3
30	Cleaners	5	
31	Plumber	30	23
32	Assistant Plumber	44	36
33	Pump Operator	183	145
34	Planning Officer	1	1
35	Office Boy (Messenger)	4	3
36	Watchman	6	4
37	Laborer		32
38	Typist	5	2
39	Secretary	1	1
40	Bill man	1	1
41	Safe Water Section Leader	2	
42	Public Relation Officer	1	1
	Total	460	333

資料 8-4 (2) : 職能別人員表 2/2 (教育及び保有資格)

Educational Level by Course and Gender				
	Unguja		Pemba	
	Male	Female	Male	Female
Mater of Science, Engineering				
Sanitary Engineering	1			
Mechanics	1			
Environmental Engineering	1			
Chemistry	1			
Hydro Geology				1
Post Graduate				
Environmental Managemer	1			
Exploration Geophysics			1	
Bachelor of Science, Bachelor of Administration				
Geology	1			
Civil Engineering	1		1	
Electrical/Electronical Eng	3			
Cartography			1	
Advanced Diploma				
Civil Engineering	2			
Environmental Engineering	1			2
Mechanical Engineering	1			
Education in Science				1
FTC: Technical Course Certificate				
Mechanics	3			
Water Technician	5			6
Water Laboratory	2		1	
Water Geology	1			
Electrical			1	4
Civil Engineering			1	
Certificate				
Book Keeping	2		2	
Store Keeping	2			
Statistics	1			
Plumbing	13		1	3
Electricity	3			
Welding	3			
Filtering and Timing	5			
Accounting	1			
Electronics				2
Computing			3	
Typing			6	
Secondary Education				
Advanced level (Form VI)	1			1
Ordinary Level (Form IV)	2		7	26
Others	330	46	271	9

資料 8-4 (3): DWD 対象地域運営維持管理体制

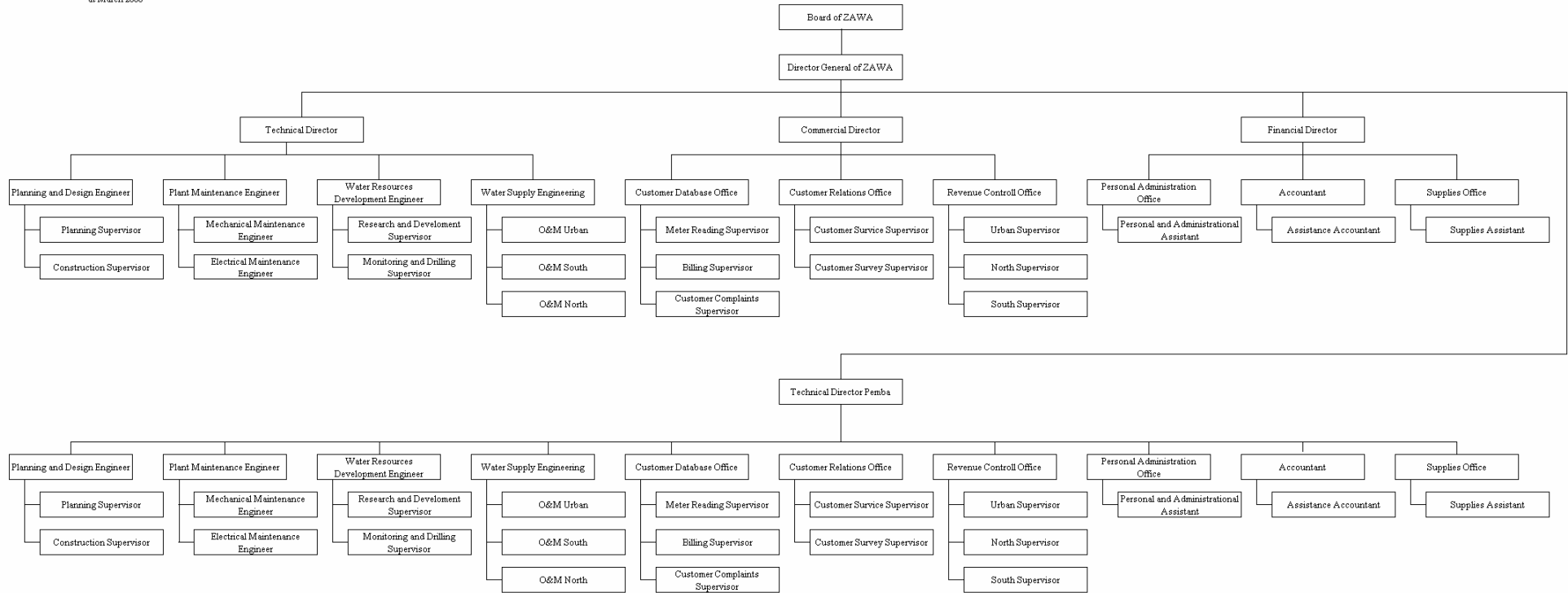


資料 8-5 DWD 予算書

		actual	actual	approved	estimated	actual	actual	approved	estimated
	Water Department	2001/2002	2002/2003	2003/2004	2004/2005	2000/2001	2001/2002	2002/2003	2003/2004
	Recurrent Revenue								
30000	Water Sales								
30001	Local Water Sales	66,468,480	72,040,700	60,000,000	65,000,000	30,579,110	66,468,480	48,000,000	60,000,000
		66,468,480	72,040,700	60,000,000	65,000,000	30,579,110	66,468,480	48,000,000	60,000,000
37000	Sales of Services, Products and Securities								
37014	Marketing Services	0	0	0	2,000,000				
37073	Craft Services	0	550,000	1,200,000	1,000,000	0	0	1,200,000	1,200,000
37099	Water Applications Fees	0	0	0	1,000,000				
		0	550,000	1,200,000	4,000,000	0	0	1,200,000	1,200,000
	sub total	66,468,480	72,590,700	61,200,000	69,000,000	30,579,110	66,468,480	49,200,000	61,200,000
P345-7	Recurrent Expenditure								
11000	Basic Salaries - Pensionable (non Pensionable Post)								
11001	Civil Servants	193,371,890	245,109,994	299,444,000	290,477,000	143,154,000	193,371,890	245,110,000	223,000,000
		193,371,890	245,109,994	299,644,000	290,677,000				
12000	Employment allowance								
12003	Leave travel	540,000	900,000	7,000,000	6,600,000	0	540,000	1,100,000	7,000,000
12005	Bus Fares	26,664,200	27,999,996	27,600,000	27,660,000	19,260,000	26,664,200	28,000,000	24,000,000
12008	Overtime	0	800,000	10,900,000	6,550,000	0	0	5,000,000	10,900,000
12012	Special Allowances	14,676,900	16,050,000	21,480,000	19,660,000	13,536,000	14,676,900	15,000,000	15,000,000
12013	Acting Allowances	0	0	100,000	200,000	0	0	200,000	100,000
12024	Bicycles Allowance	0	0	500,000	120,000	0	0	100,000	500,000
12026	Uniforms	0	0	3,000,000	0	0	0	2,000,000	3,000,000
		41,881,100	45,749,996	70,580,000	60,790,000	32,796,000	41,881,100	51,400,000	60,500,000
13000	Communication Information Suppliers and Services								
13003	Telephone and Telegram	0	2,100,000	2,000,000	1,560,000	0	0	2,000,000	2,000,000
13008	Telex and Telefax	0	0	1,000,000	601,000	0	0	200,000	1,000,000
13009	postal charges	0	25,000	105,000	105,000	0	0	25,000	105,000
		0	2,125,000	3,105,000	2,266,000	0	0	2,225,000	3,105,000
14000	Fuel and Oil								
14002	Petrol	379,600	800,000	4,200,000	2,625,000	6,800,000	379,600	3,000,000	4,200,000
14004	Lubricants	0	0	990,000	595,000	0	0	0	990,000
14005	Diesel	0	0	5,610,000	4,455,000	0	0	0	5,610,000
		379,600	800,000	10,800,000	7,675,000	6,800,000	379,600	3,000,000	10,800,000
15000	Office supplies and Services								
15003	Stationary Supplies	0	1,300,000	2,360,000	1,420,000	0	0	2,000,000	23,600,000
15006	Computer Accessories Supplies	0	0	280,000	170,000	0	0	0	280,000
15007	Sundry Items	0	426,000	1,000,000	601,000	0	0	1,000,000	1,000,000
		0	1,726,000	3,640,000	2,191,000	0	0	3,000,000	24,880,000
16000	Maintenance-Physical Infrastructures								
16002	Minor Civil Works	0	0	3,000,000	1,803,000	0	0	1,000,000	3,000,000
16003	Buildings and Establishments	0	4,000,000	2,000,000	1,202,000	0	0	4,000,000	2,000,000
16004	Punigation	0	0	4,000,000	2,404,000	0	0	0	4,000,000
		0	4,000,000	9,000,000	5,409,000	0	0	5,000,000	9,000,000
17000	machinery and Equipments Tools and maintenance								
17010	Repair and Maintenance of Equipment	6,452,600	0	7,310,000	4,393,000	0	6,452,600	15,200,000	7,310,000
17012	Purchase of Spares and Accessories	0	9,000,000	6,850,000	4,117,000	0	0	3,000,000	6,850,000
17014	Replacement ofn.Accessories and Equi	0	0	0	306,000				
		6,452,600	9,000,000	14,160,000	8,816,000	0	6,452,600	18,200,000	14,160,000
18000	Mobile Vehicles and Self-Propelled Equipments								
18002	Purchases of Motor Vehicles	0	0	8,000,000	0	0	0	0	8,000,000
18003	Purchases of Motor Cycles	0	1,800,000	2,000,000	1,202,000	0	0	2,000,000	2,000,000
		0	1,800,000	10,000,000	1,202,000	0	0	2,000,000	10,000,000
20000	Travel and Subsistence								
20009	Travel Tickets Domestic	125,000	1,100,000	1,000,000	601,000	0	125,000	1,000,000	1,000,000
20010	Travel Tickets Foreign	565,000	0	2,000,000	1,202,000	161,000	565,000	0	2,000,000
		690,000	1,100,000	3,000,000	1,803,000	161,000	690,000	1,000,000	3,000,000
21000	Training								
21004	Local Training	0	600,000	1,500,000	45,000,000	0	0	1,565,000	1,500,000
21005	Training Foreign	0	0	2,000,000	12,000,000	0	0	1,000,000	2,000,000
		0	600,000	3,500,000	57,000,000	0	0	2,565,000	3,500,000
22000	Educational materials Supplies and Services								
22001	Periodicals and Newspapers	0	0	200,000	120,000	0	0	100,000	200,000
		0	0	200,000	120,000				
23000	Hospitality								
23001	Food and Refreshment	0	0	150,000	90,000	0	0	0	150,000
23003	Refreshment	0	0	500,000	0	0	0	300,000	500,000
23004	Boarding and Lodging	0	0	545,000	500,000	0	0	0	545,000
		0	0	1,195,000	590,000	0	0	300,000	1,195,000
24000	Utilities								
24002	Electricity Charges	0	6,000,000	14,000,000	8,414,000	0	0	18,200,000	14,000,000
		0	6,000,000	14,000,000	8,414,000				
25000	Other Goods and Services not classified above								
25001	Clearing and Forwarding	0	0	500,000	1,300,000	0	0	200,000	500,000
		0	0	500,000	1,300,000				
26000	Vehicles and Mobile Equipments								
26001	Service and Repair	878,500	1,250,000	4,500,000	2,705,000	0	878,500	3,600,000	4,500,000
		878,500	1,250,000	4,500,000	2,705,000				
27000	Acquisition of Household Furniture and Equipments								
27001	Furniture/Curtains and Flooring	0	0	2,900,000	1,743,000	0	0	0	2,900,000
27003	Acquisition of Fertilizers	0	0	0	900,000				
27006	Kitchen/Appliances/Utensile	0	0	2,000,000	1,202,000	0	0	0	2,000,000
		0	0	4,900,000	3,845,000	0	0	0	4,900,000
28000	Contribution to pension and Welfare Scheme								
28001	10% Contribution to ZSSF	21,485,765	25,099,992	28,316,000	29,067,000	0	21,485,765	25,100,000	2,600,000
		21,485,765	25,099,992	28,316,000	29,067,000				
30000	Medical Supplies and Services								
30001	Procurement of Drugs and Medical Sup	0	0	5,000,000	2,500,000	0	0	1,000,000	5,000,000
		0	0	5,000,000	2,500,000				
	Total	265,139,455	344,360,984	486,040,000	435,070,000	202,913,000	265,139,455	382,000,000	397,000,000
	Special account for improving Qatar su	6,200,000							

資料 8-6 ZAWA 組織図 (案)

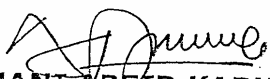
Proposed Zanzibar Water Authority (ZAWA)
at March 2006





ACT NO. 4 OF 2006

I ASSENT


{ AMANI ABEID KARUME }
PRESIDENT OF ZANZIBAR
AND

CHAIRMAN OF THE REVOLUTIONARY COUNCIL

10TH APRIL
....., 2006

**AN ACT TO PROVIDE FOR THE ESTABLISHMENT OF
WATER MANAGEMENT AUTHORITY IN ZANZIBAR
AND OTHER MATTERS CONNECTED THEREWITH**

ENACTED by the House of Representatives of Zanzibar.

**PART I
PRELIMINARY**

- | | |
|-------------------------------|--|
| Short title and commencement. | 1.(1) This Act may be cited as the Water Act, 2006 and it shall come into operation on such a date as the Minister may by notice in the Gazette appoint. |
| | (2) The Minister may appoint different dates for commencement of different parts or provisions of this Act, by notice published in the Gazette. |
| Interpretation. | 2. In this Act, unless the context requires otherwise. |



"aquifer" means any geological formation from which water in usable quantities can be extracted and or formation capable of yielding water in substantial quantities to wells and springs;

"Authority" means the Zanzibar Water Authority established by section 3 of this Act;

"beneficial use" means the use of water in such a quantity as is necessary for economic and efficient utilization, of public interest, with regard to prevention, and conservation of environment purposes;

"Board" means the Board of Directors of the Authority established under section 10 of this Act;

"building" includes any superstructure or substructure or erection of a permanent or semi permanent nature on earth;

"catchments area" means any area of land or of water delimited by the Minister, which its water contributes to the supply of any waterworks;

"Chairman" means Chairman of the Board.

"chargeable water" means the total consumption of water in any premises, house, building or vessel;

"connection to the mains" includes the stop cock and length of pipe between the stop cock and the main;



"consumer" or "customer" includes any person or body of persons supplied, or applying to be supplied with, or using water from the waterworks or who is liable for payment of any fees or other charges for the supply or use of water;

"contravention" includes failure to comply with the provision of this Act;

"cut off" or "disconnection" in relation to water supply, means to stop the supply whether by operating a stopcock or by disconnecting pipes, or in any other manner;

"Director General" means the Director General of the Authority appointed under Section 4 of this Act;

"domestic supply" in regard to any premises means supply of water necessary for the health and reasonable domestic comfort of any person residing upon or resorting to the premises during the period of that residence or resorting and includes all pipes and fittings beyond the connection to the main;

"fittings" includes all taps, stop cocks, ball cocks, cold water cisterns, hot water apparatus, flushing apparatus, or any other apparatus or appliances other than above mentioned used on an internal waterworks;

"fresh water" mean water which has been gathered and supplied to consumers which is colorless, tasteless and



odourless which contains no harmful bacteria or any other effects;

"Government" means Revolutionary Government of Zanzibar;

"ground water" means water located below the surface of the ground in the natural strata thereof and not apparent on the surface of the ground;

"internal supply" means the supply of water service to any premises, building or house;

"license" means a right granted or deemed to have been granted by this Act to abstract or use of water;

"mains" includes any pipe owned and maintained by the Authority, including connection to the main;

"member" in relation to the Board means a member of the Board and includes the Chairman;

"Meter" means an appliance, apparatus or device used to measure, ascertain or regulate the amount of water taken or used from the waterworks, and includes any meter box, meter box cover and indicator marking the position and size of the meter;

"Minister" means the Minister responsible for Water in Zanzibar;

"misuse" means the use of water against the contract or license;



"non-domestic supply" includes the supply of any water from the waterworks for the purpose of, or in carrying on, any trade, business or manufacture and construction of buildings, or for watering fields or gardens cultivated or occupied as a means of pecuniary profit, or for watering cattle, horses, donkeys, mules, sheep, goats, pigs, or other animals, kept for pecuniary profit, or for private fountains or for any ornamental purposes, or for the supply of ponds and tanks, or for laundries, vessels, ships, boats, or machinery, and included the supply of water for use by any person residing in or occupying any premises where a non-domestic supply is given;

"occupier" means any person in occupation of the premises;

"owner" in relation to any premises means the person who owns or for the time being receiving the rent in respect of the premises in question, whether on his own account or as agent or trustee or who would so receive if the premises were let at a rent;

"permit" means the permission of drilling and using traditional well without any payments;

"pollution" means any physical, chemical or biological alteration in the composition or quality of waters of the country, through the introduction, by man, directly or indirectly, of substances,



species or energy which results in effects detrimental to human health, safety or well being or detrimental to the use of water for any beneficial purposes or to the conservation and protection of the environment, including the safeguarding of the fauna, the flora, and other natural resource including the marine environment, its flora, fauna and morphology;

"premises" means any structure, building or part of a building, and includes any land with or without buildings held or occupied as a distinct or separate holding or tenancy, and any pier, or wharf;

"public standpipe" means any fountain, standpipe, tap, trough, or other appliance or structure erected, provided or maintained by or on behalf of the Authority for the purpose of supplying water to the public from the waterworks;

"safe yield" means the sustained pumping rate from an aquifer of water bearing formation in which the yield does not exceed the water in storage in that aquifer plus recharge during some defined period;

"service" means pipes, cisterns, cocks, fittings and other appliances or infrastructure, other than a meter, through which water flows or is intended to be used for the purpose of supplying of water to any premises from the waterworks;



"street" includes highway, road, lane, footway, square, court, alley or passage;

"surface water" means water located above the ground including river, lakes, sea and ponds;

"traditional well" means any well which has been drilled in the village in the open space for the purpose of the public use without being owned by any person and includes a well from which water is drawn by buckets or tin vessel;

"water right" means legal authorization to use a predefined quantity of public water for a designated purpose;

"waterworks" means all gathering grounds, reservoirs, dams, weirs, tanks, cisterns, tunnels, filters beds, conduits, aqueducts, mains, pipes, meters, fountains, sluices, valves, hydrants, pumps, prime movers and all other structures or appliances used for regulation of water, which are used or have been constructed by or on behalf of the Authority;

"well" means any natural well, borehole, edit, tunnel, gallery or other excavation constructed or used for the abstraction of ground and underground water or for the introduction of fluids directly into groundwater;



PART II
THE ZANZIBAR WATER AUTHORITY

Establishment of
Zanzibar Water
Authority.

3.(1) There is hereby established an authority to be known as the Zanzibar Water Authority or "ZAWA" in its acronym hereinafter referred to as the Authority.

(2) The Authority shall be a body corporate with a perpetual succession and a common seal capable on its name of:-

- (a) suing and being sued;
- (b) borrowing and lending money; and
- (c) taking, purchasing or otherwise acquiring, holding, changing and disposing of movable and immovable properties.

(3) The Authority shall have jurisdiction in the management of water in Zanzibar.

(4) The Authority shall be responsible to the Minister.

Composition of
Authority.

4. The Authority shall consist of: -

- (a) Director General who shall be the Chief Executive Officer appointed by the President and shall have the following qualifications:
 - (i) he is a Degree holder of the University;
 - (ii) he has the experience on waterworks of not less than five years.



- (b) Directors of the Departments of the Authority established by Regulations under this Act and appointed by the Board.

Functions of the Authority.

5.(1) The functions of the Authority shall be:-

- (a) to control, manage and protect all catchments areas and shall have mandate to take legal actions against any person or body of persons in violation of, or disturbing or encroaching the catchments areas;
- (b) to secure the continued supply of water in the country;
- (c) to develop and maintain waterworks plan and execute new projects for supply of water;
- (d) to promote the conservation and proper use of water resources;
- (e) to manage production and distribution of water on sustainable basis;
- (f) to advise the Government in formulation of policies relating to the development and conservation of water;
- (g) to collect fees for water supplied and services offered to consumers;
- (h) to specify standards of water quality, effluent and water equipments as specified in the Regulations of this Act;



- (i) to enter into any transaction which in the opinion of the Board will facilitate the proper exercise of the functions of the Authority;
- (j) to propose to the Board amendments of water tariffs and water service charges as considered necessary;
- (k) to perform any other function in pursuit of the provisions of this Act.

(2) The Authority upon the approval of the Board and in accordance with the staff regulations as established under this Act, shall recruit or hire or second any qualified staff from any Public or private Institution whether permanent or temporary, based on the requirement of the Authority:

owers and
operations of the
Authority.

6.(1) For the proper performance of its functions in relation to any specified area, the Authority may, on the advice and recommendation of the Board, establish a branch or sub-branch or Water Committees of the Authority in the specified areas in question.

(2) The Authority shall acquire land over which a branch or sub-branch of the Authority is established subject to the provision of Land Tenure Act 1992.

(3) The Authority may restrict, diminish, withhold or suspend, stop, turnoff or divert the supply of water through or by means of any mains, internal supply or standpipe, either wholly or in part, and without prejudice to any water rate, meter rent or other sum due, and without compensation for any damage or loss which may result:



the available supply of water from the waterworks of the Authority insufficient;

- (b) for the purpose of extending, altering, testing or repairing the waterworks or for the connection of internal supply or fire service;
- (c) wherever any public standpipe or public fountain is damaged or its water is polluted or wasted;
- (d) in case of outbreak of fire or breakdown in the waterworks;
- (e) when a customer fails to pay water bill or any sum due under this Act within twenty one days after notice of demanding payment has been given;
- (f) upon Interferences, tampering, or infliction of the waterworks;
- (g) in case of any breach by the customer under this Act.

(4) The Authority may, on the application or request by any person to whom it supplies or it proposes to supply water, supply to him, by way of either sale or hire, any such water fittings or appliances as required or allowed by rules or regulations made under this Act or by any other written law, and may on such application or request, install, repair or alter any such water fittings or appliances whether supplied by them or not, as the case may be, and may provide any materials and do any work required in connection with such installation, repair or alteration of water fittings or appliances, as the case may be.



(5) The Authority may make such charges as may be agreed on or, in default of agreement, as may be reasonable for any fittings or appliances supplied, or any materials provided or work done, under subsection (4) of this section and may recover those charges summarily as a civil debt.

(6) All fittings or appliances let for hire by the Authority shall:-

- (a) notwithstanding that they are fixed to some part of the premises in which they are situated or are laid in the soil under the premises, continue to be the property of, and removable by, the Authority; and
- (b) not be subject to distress or the landlord's remedy for rent, or be liable to be taken in execution under any process of court or in any proceedings in bankruptcy against the persons in whose possession they may be, so however that nothing in this subsection shall affect the valuation for rating of any ratable hereditament.

(7) The Authority may, after giving reasonable notice in writing to the owner or occupier, pass or lay any water pipes through, across or under any lands of any kind and at any time, upon giving such reasonable notice as the circumstances permit, or in case of a serious emergency without giving notice, enter upon any such lands for the purpose of repairing, maintaining, renewing, removing, inspecting, attending to or testing any such water pipe on the land, without paying any compensation but making good or, at the option of the owner or occupier, paying for any damage done or



occasioned through the operations under this section.

(8) The Authority, may, subject to the approval of the Board, guarantee the repayment of interest on a loan made to any person or body of persons or institution engaged in the development, conservation or extraction of water.

(9) With the prior approval of the Board, the Authority may invest any part of the moneys available in any fund of the Authority and which is not for the time being required for the purposes of the business of the Authority.

The Power of the Authority's staff.

7.(1) Any authorized officer may, at any reasonable time, or in the case of urgency at any time, enter into and upon any premises, into or upon which any internal supply is being or has been laid for the supply of water from the waterworks, for the purpose of:-

- (a) inspecting any internal supply and to ascertain whether there is any wastage, leakage, obstruction, alteration, interference, or damage to internal supply or meter and or anything in connection therewith;
- (b) regulating or repairing any internal supply or meter;
- (c) ascertaining the consumption; or

disconnecting the internal supply to any premises or diminish, withhold or suspend, stop, turnoff or divert the supply of water to any premises through or by means of any internal supply either wholly or in part.

(2) For the purpose of this section "authorized



office officer adjoined with the officers of the Authority or other person or institution authorized in writing by the Authority for the purpose of exercising the power of entry conferred by this section.

study and
management of
water.

8. Subject to the provisions of this Act, and any direction by the Board, management of the waterworks, water in those waterworks, its supply and distribution shall be under the Authority.

water rights.

9.(1) Upon commencement of the Authority, every person or institution owning a well or owner of water rights in any water supply area previously granted under any provisions shall, within six months after the commencement of the order, shall register such ownership of well and the right of water with the Authority.

(2) The Authority shall not supply water to any customer, unless the latter shall sign an agreement to take the supply subject to the Rules and upon the terms and conditions and at the charges therein.

(3) Water rights shall terminate:-

- (a) due to the total depletion of the source of supply;
- (b) upon declaration of total depletion by the Minister; and
- (c) due to the completion of the term during which the right was granted.