2-2-2-3 Water supply rate by this project

The water supply rate based on the selected deep wells with hand pump and spring protection facility is summarized as below. The calculation of the served population for water supply per facility was followed 250 capita per facility of Tanzania design standards.

The number of served population who will be able to obtain safe water increase 45,750 (year 2020) more. And total number of served population for water supply will become 55,151 from 9,401 in the target area.

Table 2-40: Summary of water supply rate by hand pump well facility points

Village for Hand Pump Well

Region	District	ID	Village	Water served rate by existing facility in	To be constructed well by this project	Constructed well in Development study	Spring Protection	Expected population in 2020	Water served rate in 2020
Mwanza	Sengerema	101	Sogoso	0.0%	4			6,863	14.6%
		102	Sotta	0.0%	4			5,262	19.0%
		103	Isole	17.8%	3			6,001	22.9%
		104	Busekeseke	0.0%	3			4,088	18.3%
		105	Kasoma	0.0%	5			4,836	25.8%
		106	Magulukenda	0.0%	7			6,087	28.8%
		107	Nyancheche	0.0%	6			9,176	16.3%
	Kwimba	108	Mhula	0.0%	6			3,528	42.5%
	Magu	109	Kijereshi	8.4%	4			8,207	18.3%
	Geita	110	Bugulala	0.0%	5			10,725	11.7%
		111	Kasota	0.0%	7		1	12,134	16.5%
		112	Kamena	0.0%	2			10,280	4.9%
		113	Ndelema	0.0%	1			5,191	4.8%
		114	Nyashishima	0.0%	2			2,452	20.4%
		115	Bugogo	13.0%	3			12,329	13.8%
		116	Ikina	0.0%	2	1		2,962	25.3%
		117	Ibondo	0.0%	8			9,106	22.0%
Mara	Bunda	118	Mcharo	11.4%	4	1		1,420	96.7%
	Musoma	119	Sirorisimba	0.0%	3			4,437	16.9%
		120	Ryamisanga	18.0%	5			5,295	36.8%
		121	Kisamwene	0.0%	6			4,915	30.5%
		122	Bugoji	22.0%	3			6,051	28.5%
		123	Isaba	20.0%	6			4,602	47.2%
	Tarime	124	Nyankunguru	0.0%	2			6,580	7.6%
		125	Kiwanja	24.0%	1			5,901	20.4%
		126	Bisarwi	16.6%	0			—	—
	Rorya	127	Kisumwa	15.1%	3			3,067	34.6%
		128	Nyankonge	0.0%	4			2,361	42.4%
		129	Masike	0.0%	3			3,784	19.8%
		130	Bukama	0.0%	4			5,956	16.8%
		131	Oliyo	0.0%	3			5,180	14.5%
		132	Tatwe	0.0%	4			6,059	16.5%
	Serengeti	133	Busawe	0.0%	3			1,948	38.5%
		134	Nyansurura	4.7%	6			5,003	32.9%
		135	Kebancha	6.2%	4			8,081	16.2%
Total				5.2%	136	2	1	199,868	20.5%

Scheme changed village from Public faucet to Hand Pomp Well

Region	District	ID	Village	Water served rate by existing facility in	To be constructed well by this project	Constructed well in Development study	Spring Protection	Expected population in 2020	Water served rate in 2020
Mwanza	Misungwi	201	Busongo	5.0%	5	1		5,970	29.2%
		202	Ngaya	13.0%	5			4,669	37.5%
	Sengerema	203	Buswelu	12.4%	3			4,518	23.9%
		204	Nyamiswi	0.0%	4			3,902	25.6%
		205	Nyakasasa	0.0%	5			6,823	18.3%
		206	Nyakahako	0.0%	6			9,065	16.5%
	Kwimba	207	Hungmalwa	35.0%	3			8,183	25.2%
	Ukerewe	208	Bukonyo	4.6%	2			2,655	21.8%
		209	Namilemba	4.6%	3			6,034	15.4%
Mara	Musoma	210	Saragana	9.0%	5	2		5,152	43.4%
Total				8.4%	41	3	0	56,971	24.8%
Total of Hand Pump Well				5.9%	177	5	1	256,839	21.5%

Total

Region	Water served rate by existing facility in	To be constructed well by this project	Constructed well in Development study	Spring Protection	Expected population in 2020	Water served rate in 2020
Mwnza	4.6%	108	2	1	171,049	19.0%
Mara	8.1%	69	3	0	85,790	26.4%
Grand Total	5.9%	177	5	1	256,839	21.5%

2-2-2-4 Summary of Japanese assistance

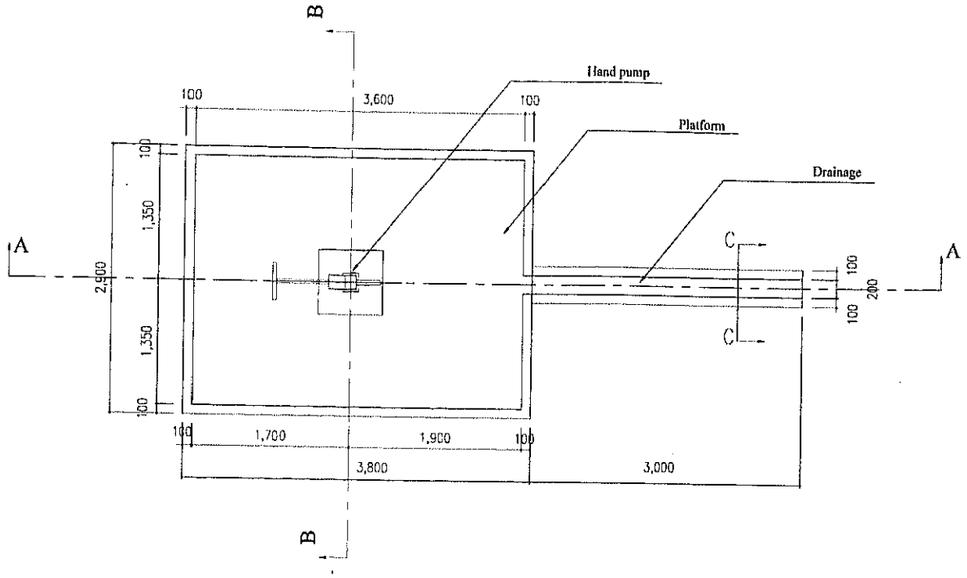
Comparison table of requested items and result of Japanese assistance is summarized below.

Table 2-41: Comparison of Requested items and result of Japanese assistance

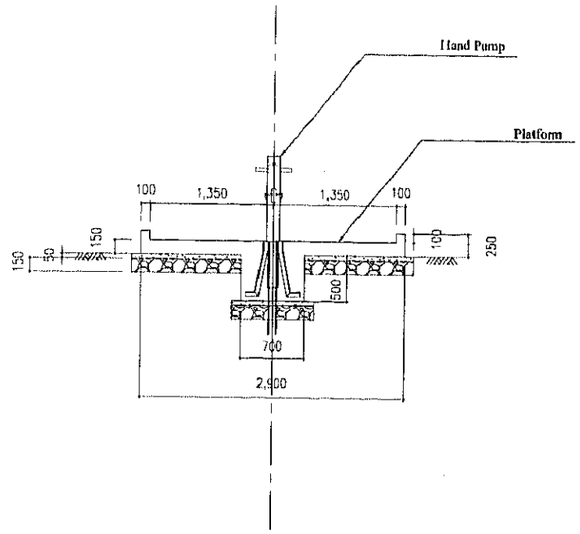
Item	Request	Japanese assistance
Equipment procurement	Well drilling equipment, associate vehicles 1 lump sum	Well drilling equipment, associate vehicles Nil
	Operation and maintenance vehicles for water supply facilities and investigation equipment 1 lump sum	Operation and maintenance vehicles for water supply facilities and investigation equipment Nil
Facility construction	Target village 45 villages	Target village 44 villages
	Construction of 289 hand pump well facilities (in 35 villages)	Construction of 177 hand pump facilities. Installation of 5 hand pumps which were secured in the Development study.
	Construction of Public faucet facility 7 schemes (in 8 villages, groundwater 4 schemes, lake water 3 schemes)	Construction of Public faucet facility Nil
	Rehabilitation of Public faucet facility 1 scheme (in 2 villages)	Rehabilitation of Public faucet facility Nil

2-2-3 Basic Design Drawing

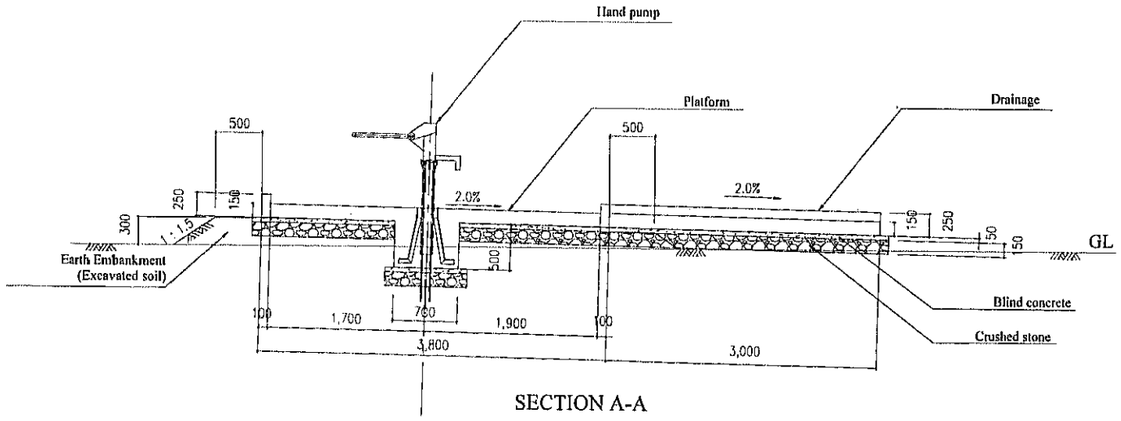
Basic Design Drawings for this project are as shown below.



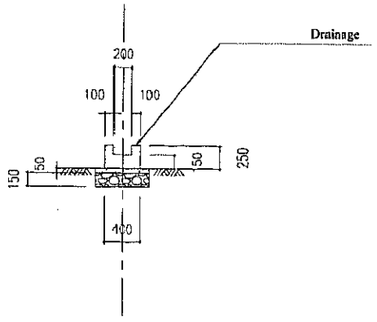
PLAN



SECTION B-B

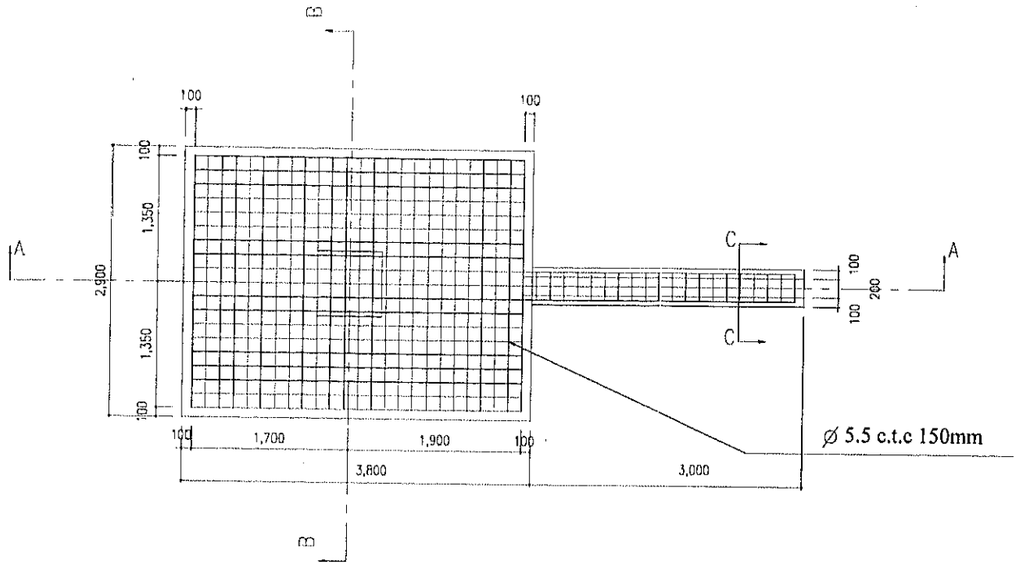


SECTION A-A

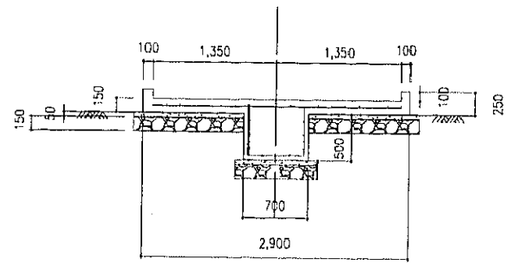


SECTION C-C

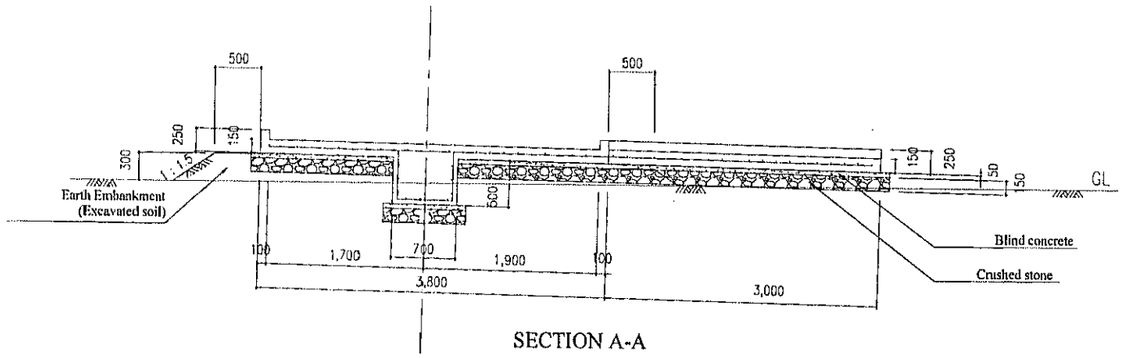
PROJECT NAME : THE PROJECT FOR RURAL WATER SUPPLY IN MWANZA AND MARA REGION	
SHEET NO. :	DATE : September 10, 2008
DRAWING TITLE : PLATFORM Design	REVISION NO.
	Scale S=1/60
CLIENT : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	
CONSULTANT : KOKUSAI KOGYO CO., LTD.	



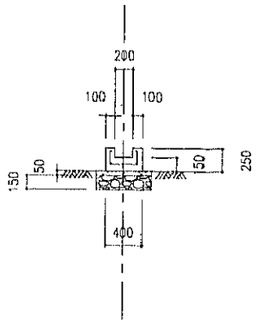
PLAN



SECTION B-B



SECTION A-A



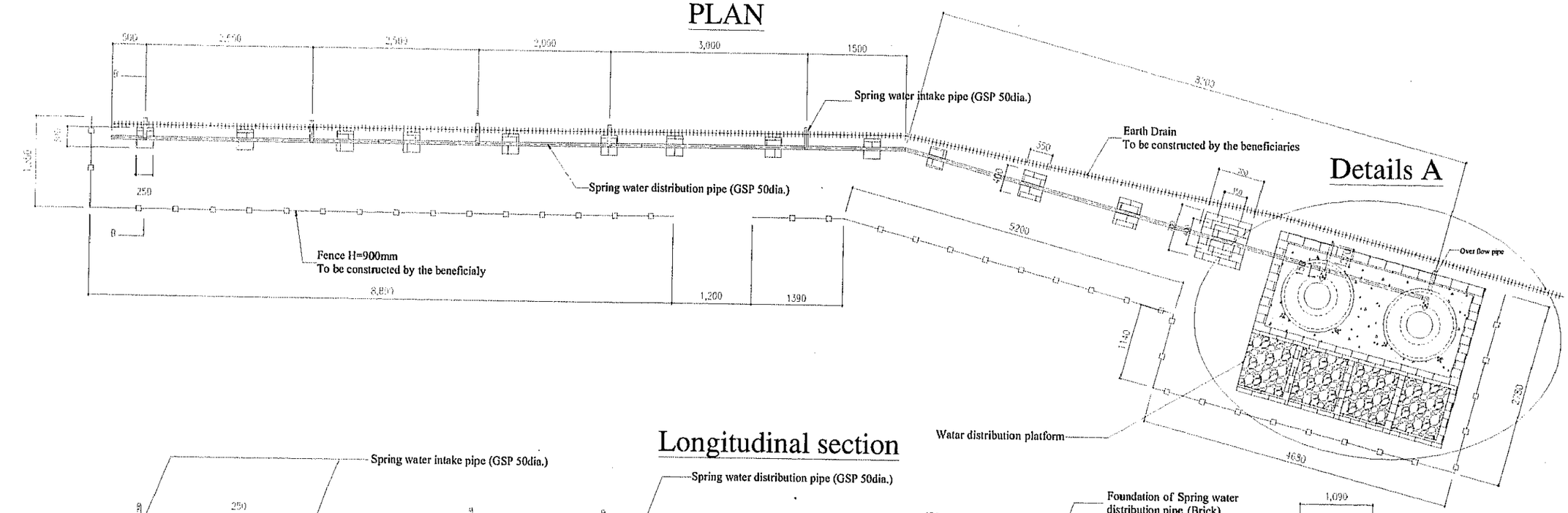
SECTION C-C

REMARK

All of the Concrete shall be used Compression Strength: 16 N/mm2
Reinforcing Steel Bar: Weldable wire mesh ⌀5.5mm @ 150mmX150mm
Over lapping length of weldable wire mesh shall be at least 150mm

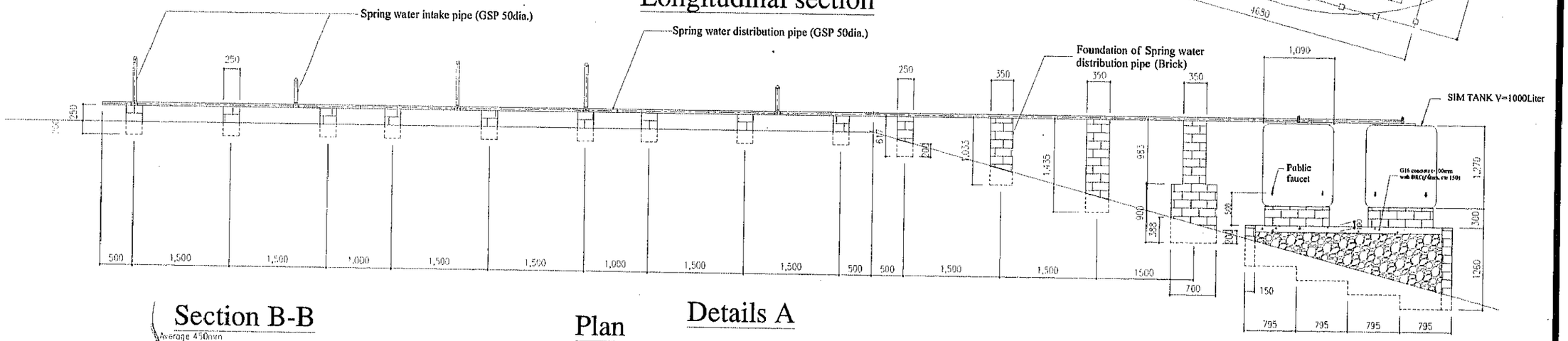
PROJECT NAME: THE PROJECT FOR RURAL WATER SUPPLY IN MWANZA AND MARA REGION	
SHEET NO. :	DATE : September 10, 2008
DRAWING TITLE : BAR ARRENGMENT	REVISION NO.
	Scale S=1/60
CLIENT : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	
CONSULTANT : KOKUSAI KOGYO CO., LTD.	

PLAN

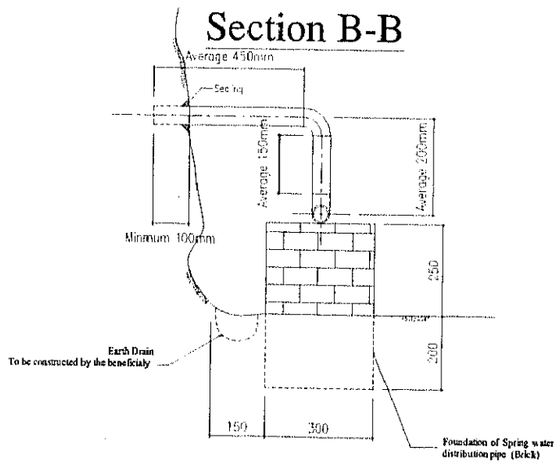


Details A

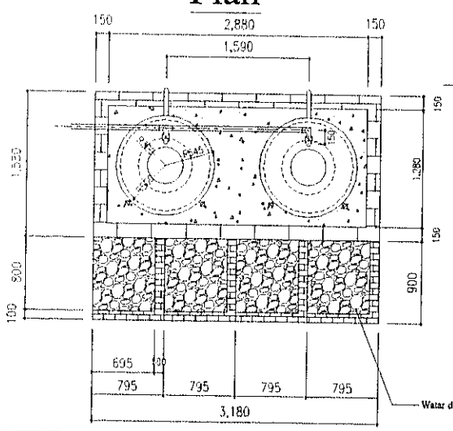
Longitudinal section



Section B-B

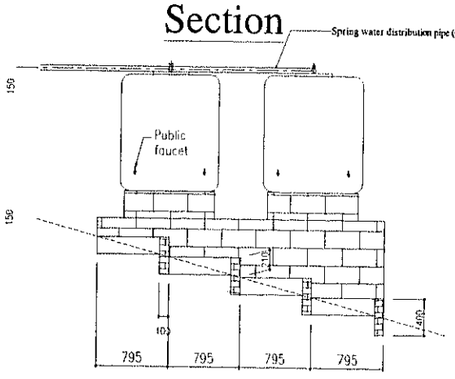


Plan



Details A

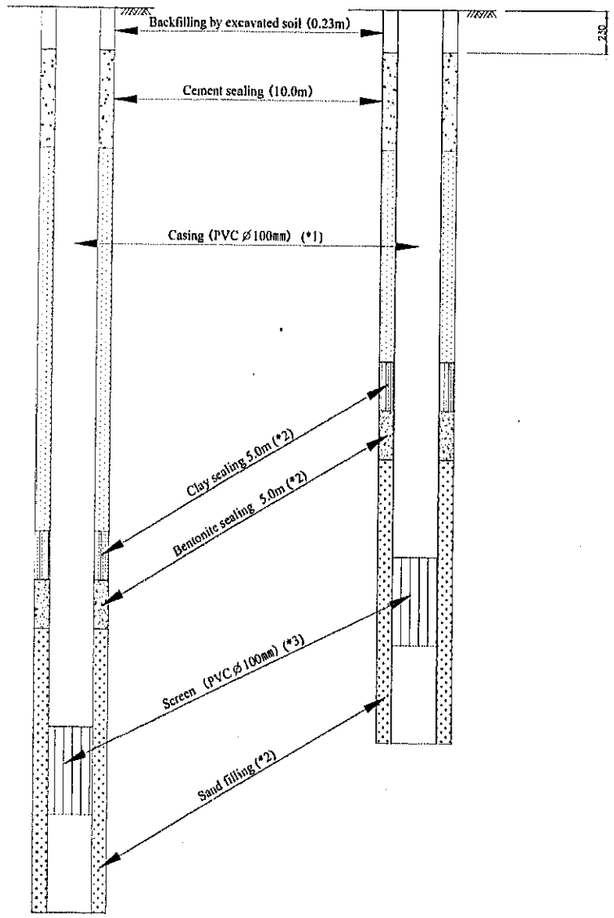
Section



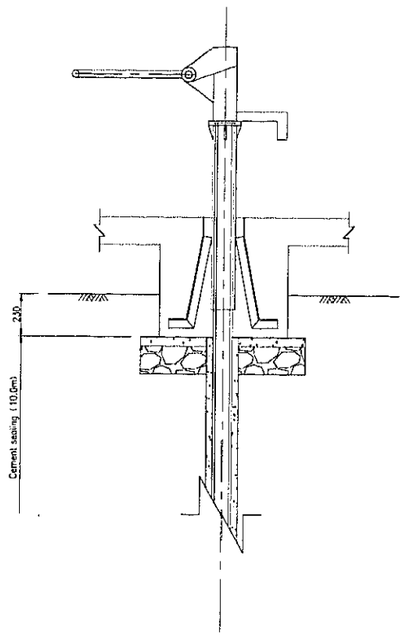
PROJECT NAME: THE PROJECT FOR RURAL WATER SUPPLY IN MWANZA AND MARA REGION	
SHEET NO.:	DATE : September 10, 2008
DRAWING TITLE: SPRING PROTECTION	REVISION NO.
	Scale S=1/60
CLIENT : JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	
CONSULTANT : KOKUSAI KOGYO CO., LTD.	

Type 1 (Expected average borehole depth 93.8m)

Type 2 (Expected average borehole depth 70.6m)



Detail for hand pump connection with casing



(*1) Length is subject to borehole depth
(*2) Length is subject to soil stratum condition
(*3) Length to be confirmed based on well logging result

PROJECT NAME: THE PROJECT FOR RURAL WATER SUPPLY IN MWANZA AND MARA REGION	
SHEET NO.:	DATE: September 10, 2008
DRAWING TITLE: Well Structure	REVISION NO.
	Scale Not to scale
CLIENT: JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	
CONSULTANT: KOKUSAI KOGYO CO., LTD.	

2-2-4 Implementation Plan

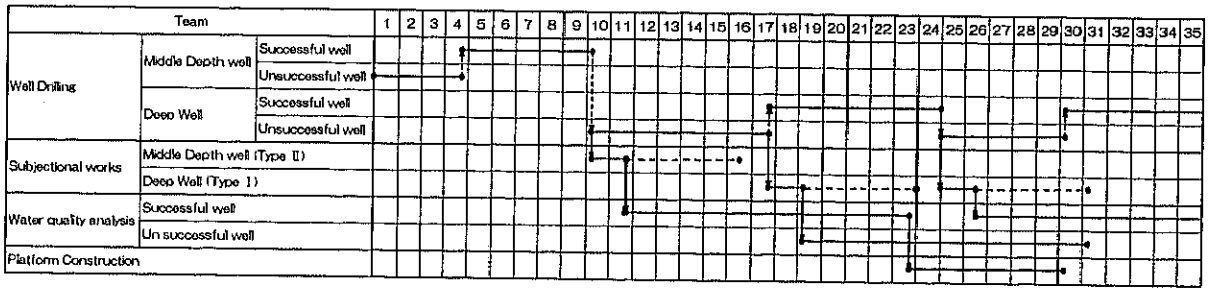
2-2-4-1 Implementation Policy

This project shall be carried out based on the following implementation policy.

1) A period of 28.4 months (2.37 years) is required from contract signing to completion so the project will be implemented by a "Government Bond Scheme" throughout the three fiscal years.

2) Construction works are categorized in three parts: "Well drilling work", "Platform construction" and "construction of spring protection". All of the well drilling works are for the hand pumps well schemes and include 17 middle depth wells (Type II, average 70.6m) and 160 deep wells (Type I, average 96.3m), for a total of 177.

3) The well drilling and platform construction are critical path activities for the entire project. For better project efficiency, three teams system is used to perform each respective part of the construction, but there will be no delays from overlapping assignment.



4) The Mud Circulation method will be adopted for drilling clay, sand and gravel on surface layer and the Down the Hole Hammer method (DTH) for drilling sedimentary rock.

5) Two offices will be set up to cover the Mwanza and Mara regions. The main office will be in Mwanza city (Mwanza region) and a satellite office at Musoma city (Mara region).

6) Local well construction company shall be utilized. However conducting well construction works at several sites in this project require precise decision making. Therefore, Japanese staffs will be allocated to manage technical matters and schedule control to avoid delays.

7) Precise schedule and quality control are required when constructing platform and spring protection facilities. Therefore, as above in (6), a Japanese civil engineer will carry out quality, schedule and safety controls.

2-2-4-2 Implementation Conditions

(1) Condition of access road to work site

Existing road conditions are not well maintained in this project area, and it will be difficult to access to some villages in rainy season. Therefore it is necessary to consider road conditions when planning the implementation schedule.

(2) Coordination with implementing agencies staffs and RWA, DWE

Staffs has been secured for operation and maintenance during this project, however they do not have enough ability and experience thus those staffs will require training. After implementing the project, VWC will require long term support by implementing agencies staffs such as the DWE staffs and RWA.

(3) Coordination with Soft Component activity

The VWC must conduct their activities sustainably to operate and maintain the water supply facilities which will require strengthening the organization, making minor repairs, conducting hygiene education and establishing a fee collection system before handing over the facilities. Meanwhile, long term support by the regional council and district council to establish a spare parts supply system and so forth is also a requirement. Therefore, the Soft Component activity will support VWC and conduct a hygiene educational program for beneficiaries. Furthermore, improvements will be made in technical skills of the staffs of the regional, district council and implementing agency as facilitators.

(4) Utilization of local contractor and local material

The local drilling contractors were evaluated as having the ability to implement this project as sub contractors, and therefore the project will utilize local contractors.

The required construction materials in this project such as cement, aggregate, reinforcement bar timber and secondary products such as steel pipe and brick are available in the Mwanza and Mara regions. From the maintenance point of view, the type of hand pump shall be selected based on two points: "Common type of hand pump in Tanzania" and "Recommended by implementation agency". There are many hand pump manufacturers, so the hand pumps shall be procured in Tanzania. The countries from which construction materials originate are summarized below.

Table 2-42: Country origin of construction materials

Description	Country origin			Reason
	Japan	Tanzania	Third country	
Cement		○		Low price and easy procurement
Fine aggregate		○		Low price and easy procurement
Course aggregate		○		Low price and easy procurement
Steel product		○		Low price and easy procurement
Form work		○		Low price and easy procurement
Timber		○		Low price and easy procurement
Fuel		○		Low price and easy procurement
Steel pipe		○		Low price and easy procurement
PVC pipe		○		Low price and easy procurement
Hand pump		○		Low price and easy procurement

However, if the materials can not be obtained locally within a certain period of time due to delivery and/or quality problems, imports from Japan or third countries may be considered. In the event it is necessary to import the material, a price comparison will be conducted between Japan and third countries and the lowest priced material shall be selected.

2-2-4-3 Scope of Work

The scope of work for facility construction to be implemented by Japanese Grant Aid for the Japanese and Tanzanian sides is shown as below.

Table 2-43: Scope of work by Japanese and Tanzanian sides

Description	Japanese side	Tanzanian side	Note
Secure construction space		○	VWC
Secure storage yard space for materials		○	Implementing agency
Prepare access road to drilling point		○	VWC, Regional and District staff
Construction of well	○		
Soil filling around well		○	
Construction of platform and drainage	○		
Installation of hand pump	○		
Planting works on the slope		○	VWC
Construction of drainage to discharge point		○	VWC

2-2-4-4 Consultant and Contractor Supervision

This project will be implemented under Japanese Grant Aid for general projects by the government of Japan, and the government of Tanzania will enter into an agreement with a consultant recommended by the Japan International Corporation Agency (JICA) for construction and procurement supervision. The contractor on the Japanese side will be made an agreement with the Tanzanian side to construct the facilities. The consultant and the contractor on the Japanese side will dispatch supervision/management

personnel as shown below.

Table 2-44: Dispatch plan of personnel for consultant supervision and contractor supervision

Description	Member	Person	In charge	Duration
Construction Supervisor of consultant	Project manager	1	Overall project management	On spot
	Drilling engineer	1	Drilling works supervision	On spot
	Resident engineer	1	Construct supervision	Full time
	Final inspector	1	Final inspection	On spot
Construction supervisor of contractor	Project manager	1	Construct supervision	Full time
	Administrate officer	1	Administrative works and procurement control	Full time
	Drilling engineer	1	Drilling works supervision	Full time
	Civil engineer	1	Civil works supervision	On spot

2-2-4-5 Quality Control Plan

(1) Method of quality control and standards

1) For Concrete

■ Materials

The materials of concrete for this project shall be used that compiling with following standards. The standards shall adopt "Concrete standard -2002 Japanese Civil Engineering".

Items	Description
Cement	Material quality
Water	Water quality
Fine Aggregate	Gradation
	Volume of hazardous substance
Course Aggregate	Gradation
	Volume of hazardous substance

■ Concrete Testing

Prior to commencement of the works, trial concrete mixing will be conduct for deciding of concrete mixing composition using approved material for an each nominal strength. Specified mix proportion shall be complied with following process. Target strength shall be set for each grade of nominal strength of concrete and fresh concrete slump test results shall be within allowable tolerance. Setting up of target strength shall be added the expected standards deviation to nominal strength.

■ Concrete production

It is difficult to secure ready-mixed concrete in this project area and thus the concrete shall be mixed

at the site using a concrete mixing machine. Accuracy of material measurement method will affect concrete strength, so the measurement method for this project is defined as follows:

Table 2-45: Measurement method of concrete materials

Item	Specification		Measurement
Cement	For structure(G21)	Minimum cement content 300kg/m^3	By weight
	For Lean concrete(G16)	Minimum cement content 250kg/m^3	By weight
Aggregate	Fine aggregate		By weight
	Coarse aggregate		By weight
Water			By volume
Admixture			By volume

■ Slump Test

Fresh concrete slump test shall be conducted at the time of concrete casting. The allowable tolerance of slump figure shall be set plus minus 1.5cm.

■ Concrete compressive strength test

Concrete compressive strength testing will be conducted at a laboratory in site office at Mwanza and Mara regions. Three test concrete pieces will be sampled once for each concrete casting. Successful concrete strength is same as nominal strength or more.

Type	Number of tests
Fck=16N/mm2	547

	Unit Concrete Volume (m^3)	Number of place (no)	Concrete Volume (m^3)	Number of casting (Time)	Total number of casting (Time)
Platform construction	2.26	182	411.32	3	546
Spring protection construction	0.73	1	0.73	1	1
Total		183	412.05		547

2) For Steel Products

The steel products which will be used in this project, quality shall be checked based on mill sheet (testing result). If mill sheet is unable to obtain, tensile strength test shall be conducted by procured materials and the qualities shall be confirmed based on the testing results.

3) For Wells

■ Material

Material specifications are shown in drawing, materials qualities shall be confirmed based on catalogues and testing results.

■ Water quality analysis

Water quality analysis will be conducted by a third party based on project water quality standards shown as below table.

Table 2-46: Project water quality standards

No	Name of Constituent	Symbol	Units	Tanzania Standard		WHO Guideline		Project Standards
				Allowable	Upper Limit	Allowable	Acceptable	
	Bacteriological							
1	Coliform	CT	MPN/100ml	0	1-3	0		0
2	Escherichia Coil	E-Coil	MPN/100ml	0	0	0		0
	Toxic							
3	Lead	Pb	mg/l	0.05	0.10	0.01		0.01
4	Arsenic	As	mg/l	0.05	0.05	0.01		0.01
5	Selenium	Se	mg/l	0.01	0.05	0.01		0.01
6	Chromium	Cr	mg/l	0.05	0.05	0.05		0.05
7	Cyanide	Cn	mg/l	0.10	0.20	0.07		0.07
8	Cadmium	Cd	mg/l	0.01	0.05	0.003		0.00
9	Barium	Ba	mg/l	1.00	1.00	0.70		0.70
10	Mercury	Hg	mg/l	-	-	0.001		0.001
11	Silver	Ag	mg/l	-	-	-		-
	Affecting Human Health							
12	Fluoride	F	mg/l	1.50	8.00	1.50		1.50
13	Nitrate	NO_3	mg/l	30	100	50		50
	Being Orago-Septic							
14	Colour		mg/l	15	50	-	15	15
15	Turbidity		mg/l	15	30	-	5	15
16	Taste		-	Not Objectional	Not Objectional	-	-	Not Objectional
17	Odour		-	Not Objectional	Not Objectional	-	-	Not Objectional
	Salinity and Hardness							
18	pH			6.5-8.5	6.5-9.2	-	-	6.5-8.5
19	Total Filtrable		mg/l	1,500	2,000	-	-	1,500
20	Total Dissolved Solids	TDS	mg/l	-	-	-	1,000	-
21	Residue	$CaCO_3$	mg/l	500	600	-	-	500
	Total Hardness							
22	Calcium	Ca	mg/l	200	300	-	-	200
23	Magnesium	Mg	mg/l	150	100	-	-	150
24	Magnesium- Sodium Salphate	$Mg-Na_2SO_4$	mg/l	1,000	1,000	-	-	1,000
25	Sulphate	SO4	mg/l	400	600	-	250	400
26	Chloride	Cl	mg/l	250	800	-	250	250
	None Toxic Metals							
27	Iron	Fe	mg/l	0.30	1.00	-	0.30	0.30
28	Manganese	Mn	mg/l	0.10	1.50	0.40	0.10	0.10
29	Copper	Cu	mg/l	1.50	3.00	2.00	1.00	1.50
30	Zinc	Zn	mg/l	5.00	15.00	-	3.00	5.00
	Organic Pollution of Natural Origin							
31	BOD	BOD	mg/l	6.00	6.00	-	-	6.00
32	PV (Oxygen abs. KMnO4)		mg/l	10.00	20.00	-	-	10.00
33	Ammonium	NH_3	mg/l	0.50	2.00	-	1.50	0.50
34	Total Nitrogen Exclusive Nitrate		mg/l	0.10	1.00	-	-	0.10
	Organic Pollution Introduced Artificially							
35	Surfactants ABS (Alkyl Benxyl Sulphonates)		mg/l	1.00	1.00	-	-	1.00
36	Organic matter as carbon in chloroform extract		mg/l	0.50	0.50	-	-	0.50
37	Phenolic substance as phenol		mg/l	0.002	0.002	-	-	0.002

Adoption value

2-2-4-6 Soft Component (Technical Assistance) Plan

(1) Background of planning the Soft Component

1) Background

The target of this project is to "provide safe water to beneficiaries living in the project area and to improve the water supply ratio". To achieve this target, not only constructing the facilities but also sustainable operating, maintaining and utilizing the facilities are required. According to Tanzania Water policy in rural water supply, operation and maintenance of the facilities shall be carried out by the beneficiaries on their own initiative with support from the implementing agencies, the district water engineer's office (DWE) and Regional Water Adviser (RWA). However, there has been little clarification of the proposed beneficiary-centered operation and maintenance system or the role of authorities in these tasks as of yet, so the policy remains brittle. Furthermore, the knowledge of the beneficiaries and implementing agency staffs concerning operation and maintenance is insufficient to conduct the works. Under these circumstances, the facilities constructed by Japanese Grant Aide Scheme would not be operated and maintained appropriately and it would be difficult to achieve the target.

2) Basic concept

177 new boreholes, hand pumps and platforms at 182 locations (including 5 existing boreholes which were constructed in the development study), and one (1) spring protection facility will be constructed in this project. The constructed facilities are to be operated and maintained by the beneficiaries with support by the implementing agency. However, existing conditions of operation and maintenance by the beneficiaries are as follows:

- O&M framework is not properly established
- The villagers lack knowledge on hygiene
- Repairing system of villagers and implementing agency for hand-pump wells is insufficient
- Capability of financial management such as the collection of the water fee and payment for repairs is insufficient
- Support for hand pump maintenance by implement agency is insufficient

The facilities to be constructed in this project shall be designed its components and spec which will be able to operate and maintain by beneficiaries. Nevertheless, beneficiaries' performance framework for O&M is considered to be insufficient, and would require support to smoothly carry out these tasks through the Soft Component (technical assistance). Output of the Soft Component activities is as follows:

Output 1:	Strengthening O&M capability of Implementing Agency and Beneficiaries
Output 2:	Reliable collection of water fees to secure operation and maintenance costs.
Output 3:	Beneficiaries understand the concept of hygiene and are able to effectively utilize facilities
Output 4:	Establishing concrete roles and responsibilities for repairing facilities
	● Minor damages are repaired by beneficiaries (Village Level Operation & Maintenance)
	● Major damages are repaired by private companies through the implementing agencies
	● Implementing agencies provide technical support to villages

(2) Objective of Soft Component

1) Objective

The target of the Soft Component is framed so that "operation and maintenance are properly conducted by the beneficiaries". Also, the overall goal is defined as "long-term utilization of facilities after completion of the project". In other words, the target is that the facility will be utilized sustainably by beneficiaries after the completion of the project, which is in agreement with the project target mentioned earlier.

2) Considerations for the support system

In order to assure work efficiency, the Soft Component activity will be conducted for each village, not for each well unit (Water and Sanitation Usage Group (WSUG) unit). In addition, to raise awareness and provide adequate education at the community level, the Soft Component activity will be conducted in two phases: 1) community development, which takes place before well construction, and 2) hygiene education and O&M, conducted during construction and after completion.

The Soft Component activity will be conducted mainly by the Japanese consultant with the support of local consultants through On-the-Job Training (OJT). The participation of DWE in this project is proposed to incorporate in its annual action plan. The exact dates and duration for which will be discussed with DWE. The project will mainly involve DWE personnel who have received education so that they can play a central role.

(3) Output of Soft Component

The expected outputs of the Soft Component are summarized as follows:

Output 1: Beneficiaries will conduct O&M activities with a sense of ownership

In order for beneficiaries to sustainably implement O&M activities, it is necessary to enhance their sense of ownership for the project. In order to achieve this, it is important for the beneficiaries to be involved in the decision making process, such as making user regulations

and operation and maintenance rules at each stage of the project. The workshop included in the Soft Component will help to ensure that VWC, WSUG and the beneficiaries have a common recognition of operation and maintenance. In addition, in order to explain the contents of this project to villagers, village meetings will be held where the beneficiaries are able to expresses their opinions freely and come to an understanding of the project.

Output 2: Clarify the roles and support system of WSUG and the implementing agencies

So far, a number of user unions have been organized in villages, but a closer look at the actual state of their activities reveals a significant margin for improvement. In addition, the establishment of user unions and other beneficiary organizations alone is not enough, it is necessary to have a cooperative system between the villages and the implementing agencies (i.e. DWE and RWA) that support operation and management by providing technical guidance and hygiene education. With the Soft Component, analysis of the related parties is carried out and the workshop pays mind to all related parties such as WSUG, VWC and the villagers. This clarifies the roles of each party and serves to construct a cooperative system of mutual connections where, with the beneficiary at the center, the operation and maintenance framework is built on a solid foundation.

Output 3: Formulation and execution of O&M plan based on the role of beneficiaries in the villages

In order to carry out beneficiary-centered O&M, the beneficiaries themselves shall formulate a feasible operation and maintenance plan. Nevertheless, given that beneficiaries are inexperienced in such tasks, it would be ideal that the implementing agencies (DWE and RWA) provide support, however, in this case, neither DWE nor RWA possess sufficient experience to do so. With the DWE staffs as facilitator, a workshop is held targeting the beneficiaries, where they decide on an operation and maintenance plan which includes usage rules, measures to deal with maintenance and repair, and special measures, such as how to handle payment of water fees for those without the economic resources to do so. Consideration for such disadvantaged members of society is an important element to ensure that the water supply is widely utilized by the villagers. This workshop is conducted using OJT, which improves the ability of the DWE staffs to support the villagers.

Once the operation and maintenance plan is decided, it is carried out as prescribed and the villagers and related personnel collaborate to conduct monitoring and evaluation of the conditions. A realistic and effective plan will be put in place based on the practice of reviewing these results and making any necessary revisions.

Output 4: Master the techniques needed for operation and maintenance

In order to promote operation and maintenance by the beneficiaries themselves, it is necessary for DWE and RWA to acquire the techniques needed to encourage villager participation. The persons in charge at the implementing agencies receive training on theory and concrete techniques regarding villager participation so that they are able to properly support operation and maintenance. In addition, to uphold regular maintenance management, it is necessary to establish a framework which WSUG performs daily maintenance of the facilities and repairs minor malfunctions and if WSUG is unable to handle a repair, it corresponds with DWE staffs for repair (who contact a well repair professional). Mechanical training regarding facility maintenance and repair will be carried out for the persons in charge of facility management in the WSUG or VWC, or the DWE staffs, so that the person in charge is able to acquire the necessary skills. A relationship of trust between the community (village) and the implementing agency (DWE) is strengthened when a members of DWE act as the instructors to train the facility manager of the WSUG.

Regular operation and maintenance also necessitates that the facility utilization fee is properly collected and managed. In addition to training on daily operational costs, the VWC chairmen and accountants receive training regarding the rate-making of facility utilization fees by taking into consideration the price of spare parts, travel costs for DWE staff, etc., and fee collection management methods. Furthermore, it is necessary to keep records of facilities usage and work done in connection with accounting and monitoring, so the person in charge at VWC is given training on this and how to produce the records so that this is carried out faithfully.

Output 5: Improve beneficiaries' concept of health and hygiene

Reportedly, one of the reasons why facilities fall into disuse is poor awareness of hygiene. In particular, usage of conventional water sources (such as rainwater and surface water) in the rainy season will cause various hygiene problems. As such, hygiene education is provided to beneficiaries, and the usage of clean water, improvement of the health condition of villagers and the practice of regular operation and maintenance measures will be promoted.

(4) Indicator of output achievement

The indicator and measurement used to confirm the achievement of the five output items are given in the table below.

Table 2-47: Indicator to achieve output

No.	Output	Indicator	Measurement
1	Beneficiaries will conduct O&M activities with a sense of ownership	1. Do authorized personnel have common recognition of the role of the beneficiaries in operation and maintenance?	1. Questionnaire to person concerned
2	Clarify the roles and support system of WSUG and implementing agencies	1. Is the role of the concerned authority clear? 2. Is the role of the concerned personnel clear?	1. Organization Chart for O/M 2. Questionnaire to person concerned
3	Formulation and Execution of village O&M plan based on the role of beneficiaries	1. Is user regulation formulated? 2. Are measures for maintenance and repair clear? 3. Are monitoring and evaluation conducted according to plan?	1. User regulation 2. Maintenance and repair regulation 3. Monitoring record
4	Master required technique for operation and maintenance	1. Have periods of breakdown decreased? 2. Has the frequency of breakdowns deceased? 3. Are reports made and kept for collection of water fees, operation and maintenance?	1. Activity records for VWC, WUG 2. Operation records 3. Records
5	Improve beneficiaries' concept of health and hygiene	1. Has the beneficiaries' concept of hygiene education improved?	1. Questionnaire to beneficiaries

(5) Activities of the Soft Component (Input Plan)

The Soft Component activities are categorized into two sections: community development before construction, and hygiene education and O&M activity during construction and after completion (refer to next page). The activities will be carried out by the Japanese consultant and participation by DWE and RWA will be promoted, if necessary.

Community development (Before construction)

A1: Participatory approach

A2: Form VWC and WSUG

Hygiene education and O&M (During construction and after completion)

A3: Management training (accounting, record-keeping)

A4: Operation and maintenance plan

A5: Technical training

A6: Hygiene Education

Table 2-48: Contents of Soft Component Activity

	Activity Items			Contents	Feature	Target Audience
Communitee development	A1 Participation approach	A1-1	Beneficiary participation training	Provide beneficiary participation training to related organizations	Seminar, on the job training	DWE, RWA
		A1-2	Village meeting	Organize village meeting to spread understanding of the project	Village meeting	Beneficiaries
	A2 Form VWC and WSUG	A2-1	Re-examine VWC structure	Re-examine VWC organization based on current activity	Workshop	VWC
		A2-2	Establishment of O/M organization	Establish O/M organization based on beneficiary level	Workshop	VWC、WSUG
Operation & Maintenance and Hygien Education	A3 On the job training for management (Accounting, recording)	A3-1	Accounting training (C/P staff)	Provide C/P staff with training for accounting, reporting, recording	On the job training, seminar	DWE, RWA
		A3-2	Accounting training (Accountant)	Provide accountant with training for accounting, recording, reporting	On the job training, seminar	Person in charge for accounting of VWC
	A4 Planning for O/M	A4-1	Formulation of O/M Planning	Formulate operation and maintenance plan including user regulation, response to breakdowns at each villages	Workshop, on the job training	Beneficiaries
		A4-2	O/M Activity	Conduct O/M activity based on O/M plan	Monitoring, recording	Beneficiaries
	A5 Technical Training	A5-1	Technical Training	Conduct technical training for reparing of hand pump	On the job training	DWE, RWA
		A5-2	Training for person in charge	Provide person in charge with technical training for facility repairs	On the job training	Person in charge for facilities operation of WSUG
	A6 Hygiene Education	A6-1	Hygiene Education	Provide hygiene education to beneficiaries	Seminar	Beneficiaries
		A6-2	Guidance visit	Provide guidance visit for hygiene education to beneficiaries	Guidance visit	Beneficiaries

(6) Contents of Activities

The contents of the Soft Component activities are as below. The flow diagram of these activities is shown in Figure 2-17.

1) Community development: before construction

A1-1 Beneficiary participation training

Beneficiary participation training required to facility operation and maintenance will be provided to DWE staffs and RWA. Training will include a lecture concerning conceptual matters such as effectiveness for visualizing the discussion items and the consideration for gender and the social weaker. In addition, the presenters will make use of comment cards for participants to express their opinions freely when holding a meeting, and methods to practice concrete techniques such as gender analysis and the seasonal calendar.

Activity output: Beneficiary participation training report

A1-2 Village meeting

Village meetings are held, attracting many of the beneficiaries in the target village. The central focus of the meeting is for DWE staffs to explain the project, but it is also necessary for the beneficiaries to understand the reason for the selection of facility level, the role of villagers in operation and maintenance, and, especially, collection of the utilization fee.

Activity output: Village meeting report

A2-1 Re-examination of VWC structure

A workshop will be held for existing or previous VWCs which will focus on reviewing past activities and clarifying issues and problem areas through discussion. Based on the results of this discussion, consideration will be given to future operation and maintenance centered on beneficiary participation, and this will include discussion on the members of VWC, their roles, method of member selection and management.

Activity output: Minutes of VWC re-structuring meeting

A2-2 Establishment of Operation and Maintenance organization

A workshop will be held among beneficiaries, WSUG, VWC and village council, establishing an organization for operation and maintenance that is main body by beneficiaries.

Activity output: Workshop report, Draft report of O&M organization

2). Hygiene education and Operation & Maintenance: During construction and after completion

A3-1 Accounting training (for C/P staff)

Administrative training is conducted for DWE staffs and RWAs on collection of management fees, method of maintenance, method of operation and recording of operating conditions. In addition, training will be held on cost calculation for repair work orders from VWC.

Activity output: Accounting training report (Implementing agency)

A3-2 Accounting training (for person in charge)

Administrative training for accountant and chairman of VWC not only daily operating cost but also the methods of setting, collecting and managing water fees with regard to costs incurred when DWE arranges repairs and purchases spare parts, and record-keeping of facility operation.

Activity output: Accounting training report (Person in charge)

A4-1 Formulation of O/M plan

A workshop will be held for beneficiaries facilitated by DWE. The workshop will help to analyze utilization of water and facility problems using the Project Cycle Management (PCM) method. On the basis of the results, participants formulate the O&M plan including user regulations, a manual for dealing with breakdowns and a monitoring plan. User regulation shall include the amount for the water fee, method to collect the fee and special measures for the social weaker. Through this

workshop, the beneficiaries are expected to come to recognize the necessity of their central role in operation and maintenance. In addition, the workshop will also give DWE an opportunity to learn technical skills as a facilitator.

Activity output: User regulations, Breakdown management manual, Monitoring plan

A4-2 O&M activities

DWE will monitor the real situation of the activities to confirm that it is carried out along with established operation and maintenance plan to ensure that the plan will be practiced absolutely. The local consultant will follow-up by checking that activity records are being produced properly.

Activity output: O&M activity report

A5-1 Technical training (for C/P staffs)

Technical training, such as for hand pump repair, will be provided to DWE staffs and RWAs to transfer such technology. In addition, information is shared on the method of response in case a major breakdown arises which can not be repaired by VWC or WSUG and the method of purchasing the spare parts.

Activity output: Technical Training report (Implementing agency)

A5-2 Technical training (for person in charge)

Technical training will be provided to the person in charge of VWC on minor repairs and such, facilitated by DWE. In addition, information is provided on how to purchase spare parts and such necessary for operation and maintenance.

Activity output: Technical training report (Person in Charge)

A6-1 Hygiene education

Hygiene education will be provided to beneficiaries in order to improve their health and regular, long-term utilization of facilities. The seminar will focus on the prevention of water-borne disease, and also include general health issues such as the prevention of communicable diseases, nutrition intake, and preventing overwork. The hygiene education program is provided to beneficiaries as an opportunity to improve their awareness of hygiene and improve their motivation to conduct operation and maintenance.

Activity output: Hygiene education report

A6-2 Guidance visit

In order to improve the way of villagers think and act regarding hygiene, a guidance visit will be held as a follow-up measure. The target of this visit will be selected based on the circumstances in each village; however from an effectiveness point of view, individual guidance will be provided for households mainly through women's groups and the PTA.

Activity output: Guidance visit report

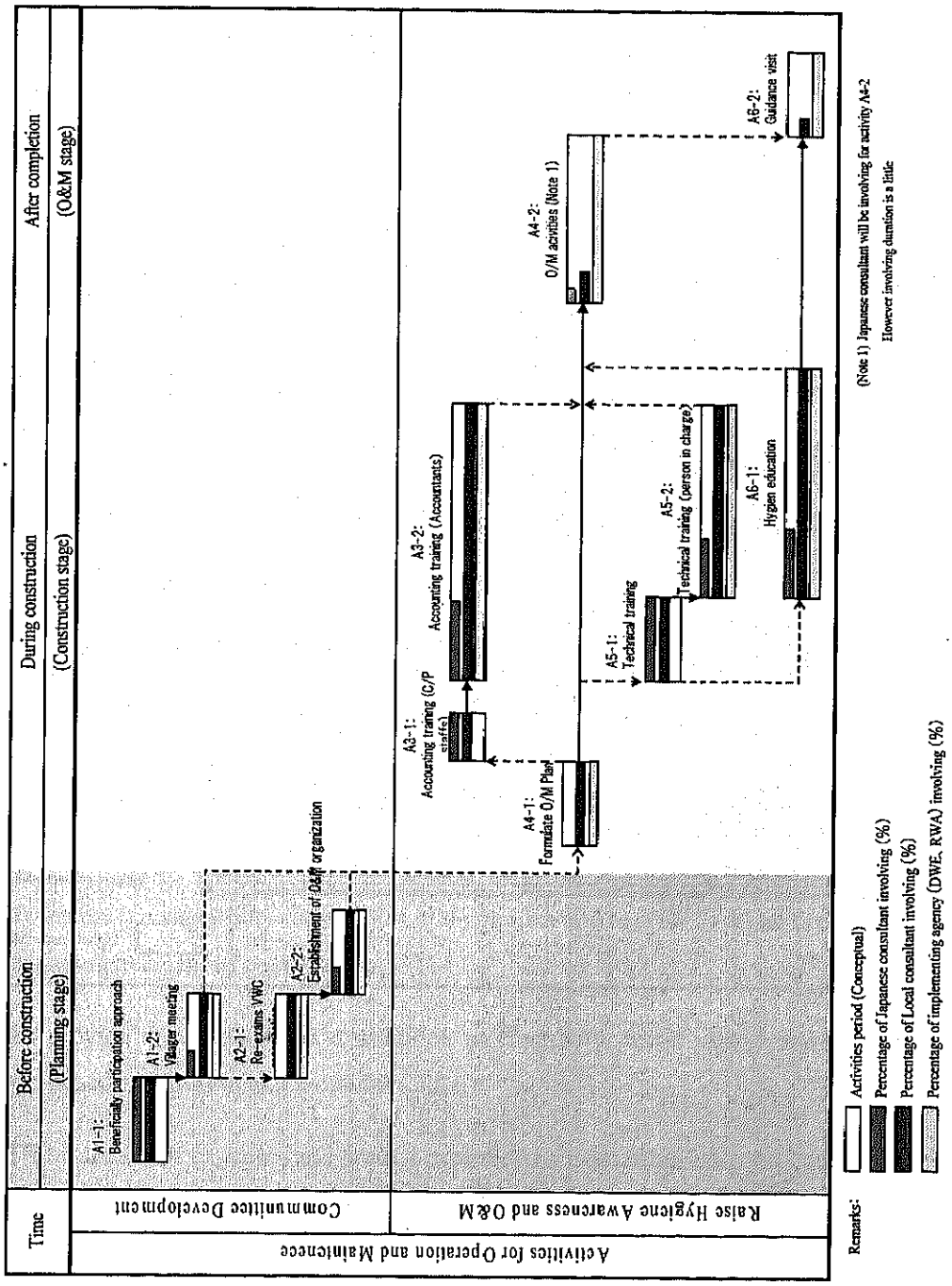
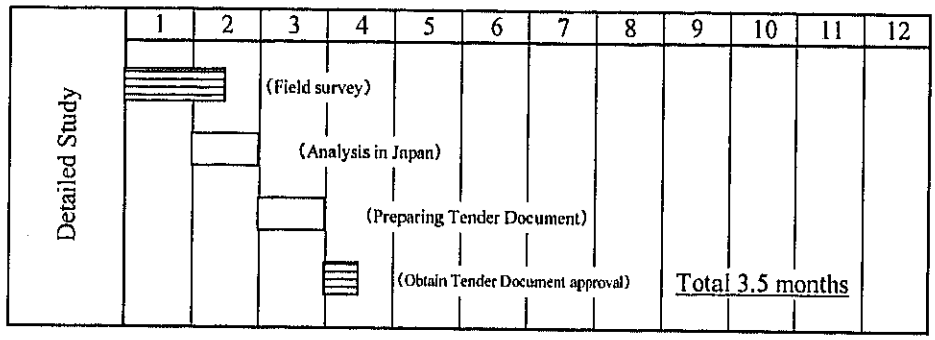


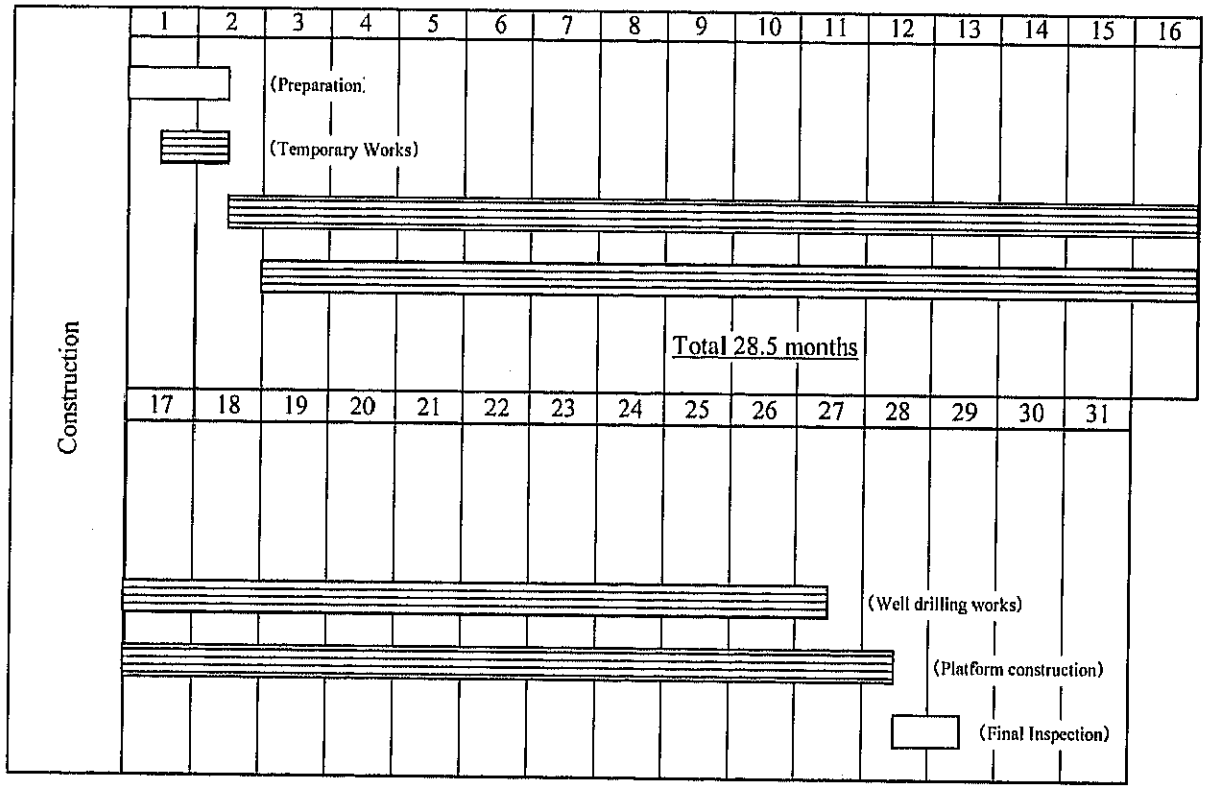
Figure 2-17: Activity flow for Operation and Maintenance

2-2-4-7 Implementation Schedule

The implementation schedule of this project is shown below

Table 2-49: Implementation schedule





2-3 Obligation of recipient country

2-3-1 Specific items for this Project

The following special items are required to be taken by the Tanzanian side when carrying out the Japanese Grant Aid scheme.

1) To assign some C/P personnel who will work together with Japanese consultant for operation and maintenance and hygiene education during the technical assistance program of the project (DWE, RWA)

2) To bear the allowances and other expenses related to the activities for C/Ps

3) To plant grass on slop of the platform to prevent soil erosion (by beneficiary)

4) To excavate drainage ditch from the end of drain of the platform to avoid water pool (by beneficiary)

5) To construct fence around platform to protect from animals (by beneficiary)

6) To attend the inspection for procured equipment (upon request of the consultant)

7) To secure staffs and the budget to establish operation and maintenance organization (RWA DWE)

8) To improve organization for the purpose of monitoring operation and maintenance

2-3-2 General items

In the implementation of the Japanese Grant Aid Scheme, the recipient country is required to undertake certain measures, as follows:

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

4) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies, this will be imposed in the recipient country with respect to the supply of the products and services under the verified contracts.

5) 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 that may be necessary for their entry into the recipient country and stay therein for the performance of the work.

6) The recipient country is required to operate and maintain 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 converted by the Grant Aid.

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

8) 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 an authorized foreign exchange bank in Japan (hereinafter referred to as "Bank"). The Government of Japan will execute the Grant by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under verified contracts. The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

9) The Government of the recipient country should bear an advising commission of an Authorization to pay and payment commissions to the Bank.

2-4 Project Operation Plan

2-4-1 Basic Policy

There are some problems facing the target area that cause concern about effective and sustained use of the water supply facilities constructed in the project.

- Slow progress of transfer the utilization from unsanitary shallow well to deep well with hand pump due to lack of hygiene knowledge
- Low ability for fund management (from fee collection to payment of repairing cost)
- Inadequate repairing system of the hand pump well
- Lack of support for O&M of the hand pump wells in villages by RWA and DWE

Solutions to the above problems and smooth implementation of O&M activities relating to the water supply facilities to be constructed in the project are expected through the following basic policies.

- To promote effective use of wells which have clear water by the implementation of the hygiene education
- To make certain collection of water fees to cover O&M cost
- Clear division and implementation of roles relating to repairs as follows:
  - Minor repairs are performed by the residents (Village Level Operation & Maintenance).
  - RWA and DWE provide technical support to the villages.
  - Major repairs are performed by a private contractor through RWA and DWE.
- To reinforce sustainable use of hand pump wells, the Soft Component (support program for the enhancement of O&M skills), such as the formation of beneficiaries' organizations, reinforcement of the O&M system and hygiene education, is introduced.

2-4-2 Establishment of Operation and Maintenance Management System

A Water and Sanitation Users' Group (WSUG) is established for each hand pump well. The group chooses a leader and caretakers and carries out daily inspections, cleaning, minor repairs and collection of O&M costs.

A Village Water Committee (VWC) is established in each village. The committee presides over the village WSUG and requests RWA and DWE, the implementing agencies to support O&M, repairing the facilities, delivery of spare parts, etc.

The overall structure of village well operation and maintenance is as shown in Figure 2-18 and Figure 2-19. The roles and structure of O&M organizations hand pump well are given below. The O&M will

slightly vary depending on the description (specifications) of the hand pump to be used, but at the present stage the O&M structure being investigated is for using the Afridev type pump.

1) Water and Sanitation Users' Group (WSUG)

A) Role

- O&M of the water supply facilities
- Minor repairs of the water supply facilities
- Collection of O&M costs from users and payment to VWC

B) Structure

- Group leader (1): Acts as a coordinator for WSUG users. Decides and the rules for using the hand pump wells and its observe strictly. Implements the rules on use of the wells. Contacts VWSC when the well breaks down. Collects the O&M costs.
- Caretakers (1 man, 1 woman): Regularly inspect the hand pump wells, perform repairs and clean up around the wells, etc.

2) Village Water Committee (VWC)

A) Role

- Promotion of formation of WSUG and coordination of groups
- Contact point for village in negotiations with RWA and DWE
- Safekeeping of O&M funds
- Technical support for WSUG in O&M of hand pump wells

B) Structure

- Chairman (1): Acts as coordinator for WSUG, notifies RWA and DWE when a well breaks down, communicates with other administrative agencies
- Person in charge of management of the facilities (1): Acts as coordinator in technical areas such as support for repair of the water supply facilities and procurement of spare parts
- Person in charge of hygiene education (1): Promotes hygiene education. Verifies the cleaning of each

well

- Person in charge of accounts (1):
  Manages the water fees paid by WSUG. Reviews subsidies for major repairs, etc.

3) District Water Engineer's Office (DWE)

- Management of well inventory
- Regular visits to water supply facilities and arrangement for repair major breakdowns
- Support for procurement of spare parts
- Provision of O&M education
- Technical support for WSUG regarding minor repairs

4) Regional Water Advisor (RWA)

- Supervision of DWE
- Technical support for DWE
- Support for procurement of spare parts
- Arrangement for major repairs
- Guidance for setting up VWC and WSUG
- Provision of hygiene education
- Fostering of private well repair firms

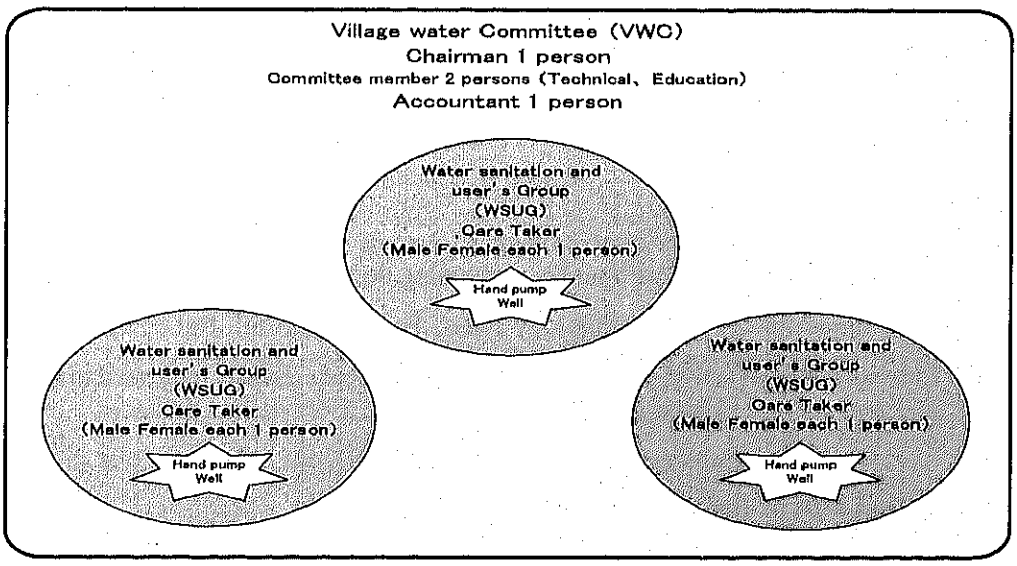


Figure 2-18: Organization chart for Operation and Maintenance

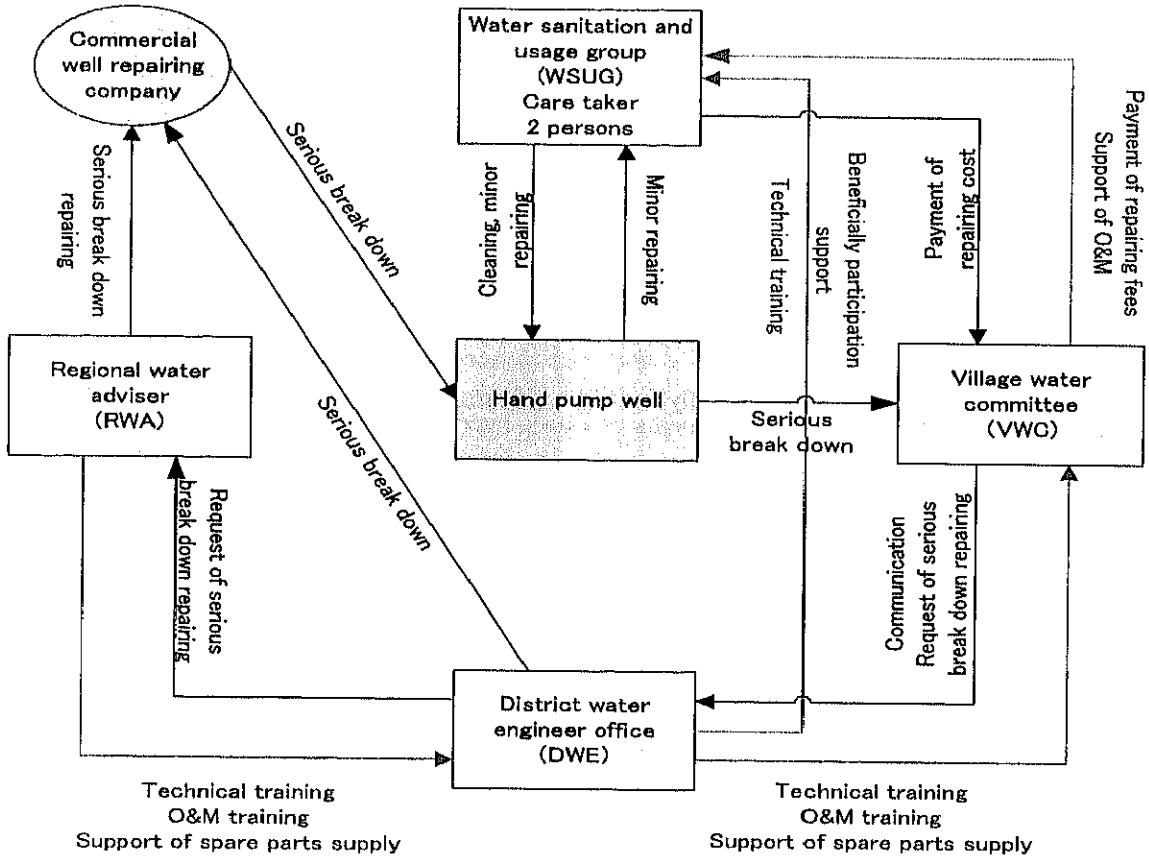


Figure 2-19: Relationship chart for Operation and Maintenance

2-4-3 Establishment of Repairing System for Water Supply Facilities

1) Minor Breakdown

If the water supply facilities can be repaired easily, such as by changing the spare parts, the village purchases the necessary spare parts with its own funds and the caretaker changes the spare parts. DWE provides technical guidance to the WSUG if necessary.

2) Major breakdown

VWC entrusts repair to the private well trader concerning the breakdown which requires the special equipment and technique for the well technology which becomes skilful. But at the area where the private well trader has not been active, introduction of the repair consignee is requested to the RWA and DWE.

2-4-4 Operation and Maintenance Cost

In principle the operation and maintenance cost shall be borne by the beneficiary. More information concerning O&M cost is written in "2-5-2 Operation and Maintenance Cost".

2-4-5 Establishment of Supply System of Spare Parts

The firm that supplies spare parts for hand pump wells has an office in Dar es Salaam, but such an office or outlet store in the Mwanza and Mara regions is rare. The main reason for this is that there are too few hand pump wells in the Mwanza and Mara regions at present. If the number of wells increases through the implementation of this project, such stores selling spare parts may be set up, but this is uncertain, so plans are based on the current stores in Dar es Salaam. Nevertheless, although the outlets in Dar es Salaam carry standard sets of spare parts, most of the well beneficiaries are unaware of the location or contact information of these shops, or are in a situation where the distance is over 500 kilometers to the shop, making a trip there virtually impossible.

A system to purchase and distribute spare parts is therefore proposed whereby, depending on the individual inclination of representatives from DWE, WSUG and the stores, a store could deliver directly to the village or WSUG and accept payment, or DWE could collect payment to make a group purchase and then deliver the parts to villages.

To ensure reliable O&M for the present period, all 182 sets of spare parts will be distributed under the project. Nevertheless, distribution to WSUG could stall the collection of O&M fees, so the possibility of having DWE hold on to the sets in now being explored.

2-4-6 Hygiene Education

There are many shallow wells in the target area, so the question of water quality is more important than quantity. In other words, even if good quality water resources are developed, unless there is a shift away from using unsanitary water that residents have been drinking, an effective reduction in waterborne disease may not be seen. To avoid this, it is necessary for the residents to be fully aware of the importance of using good quality water by learning the facts of hygiene, leading to a positive change in their attitude to water use.

More precisely, hygiene education is planned as follows:

- One-day training for hygiene education trainers will be held for RWA and DWE personnel.
- The hygiene education manual to be prepared by the study team will be used as teaching material, and the stock of teaching materials prepared in the past by UNICEF and WHO and supplied to MoWI will be used as support materials.
- Hygiene education deals with three themes, "water", "sewage" and "waste".

2-4-7 Participation of Beneficiary in the Construction Works

The objective of beneficiary participation is to reinforce their sense of ownership and heighten sustainable use of the water supply facilities. In addition, it is expected that the strength the cooperation between the implementing agencies and the beneficiaries by the promoting participation in the construction from the agencies to the beneficiaries. Beneficiary participation is limited to the following tasks, which do not affect the essential functions of the water supply facilities.

Table 2-50: Work list for beneficiary participation

Beneficiary Participation Work	% of Participation
Planting on slope faces. Planting of plants available in the village area to prevent erosion of slopes and to maintain sanitary environment around the water supply facilities.	Partial Participation as necessary
Stagnant water around the platform drainage ditch is not desirable in terms of sanitary conditions as it leads to accumulation of trash, dirty water penetrating into the well, mosquitoes breeding, etc. Therefore, drainage channels will be constructed from the drainage ditch to the existing channels and fields to avoid stagnant water. This work will be done by residents.	100%
Installing fence around hand pump facility in order to prevent unsanitary water which are created by animal will contaminated	100%

2-5 Project Cost Estimations

2-5-1 Initial Cost Estimation

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

(1) Obligation of Tanzanian side

The following cost shall be born by the Tanzanian side.

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

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

(2) Condition of Quotation

1) Time of Estimation

Project cost was estimated in February 2007 when the field survey of the Basic Design Study was completed.

2) Exchange rate

Project cost was calculated using the average rate in six months from August 1, 2007 to January 31, 2008.

1US$=114.35 Yen、1TSH=0.0963 Yen

3) Schedule for Facility Construction and Equipment Procurement

Schedule for facility construction and equipment procurement is shown in "2-2-4-7 Implementing Schedule".

4) Others

Project cost was estimated according to the Guideline of Japanese Grant Aid.

2-5-2 Operation and Maintenance Cost

In principle, the costs related to operation and maintenance shall be borne by the beneficiaries in this project. Annual operation and maintenance cost for each hand pump well facility (250 persons, 50 households), which includes replacement of parts, regular checks, well cleaning and replacement of the hand pump, is estimated to total TSH 562,284, or TSH 11,246 per household. Based on the social economic survey, the minimum payable amount for water is TSH 11,981, and thus operation and maintenance costs for this project are set within a payable amount by the beneficiaries without any government support. It is therefore considered that the facilities can be maintained sustainably by the beneficiaries.

Table 2-51: Annual O&M cost for one hand pump well unit

No.	Description		Specification	Q'ty	Unit rate (Tsh)	Parcentage for O&M	O&M Cost (Tsh)
1	Structure	Platform	On ground concrete	1	388,350	1%	3,884
2	Equipment	Pump	Handpump	1	1,548,000	5%	77,400
3	Well		Well cleaning	1	845,000	20%	169,000
4	Pump attendance	Pump maintenance	Pump management (General Worke	52	3,000	100%	156,000
			Fee corrector (General Worker)	52	3,000	100%	156,000
Total (per year per facility) (1)							562,284
Total (per year per HH) (2)			(1)÷50HH				11,246

2-6 Consideration for implementing of the project

(1) Road condition in rain season

Condition of most of the roads in the target area is unpaved and it will become muddy during rainy season. It is required to make detail construction schedule considering rainy season and road condition for implementing of the project.

(2) Type of Hand Pump to be adopted

The selection of the hand pump MoWI is recommended to select hand pump within Afridev type, Malda type and Walimi type for spare parts supply point of view. Afridev type is adopted in this project.

(3) Formulate spare parts procurement system

There are a few kind of method of spare parts procurement which supplier directly supply and collect cost from either village or WSUG, or implementing agency buy spare parts in a lump on behalf of them and contribute to village. The method will be decided based on the discussion with WSUG, implementing agency and supplier.

WSUG shall buy necessary spare parts by themselves and care taker shall conduct minor repairing and exchange of spare parts. Implementing agency shall conduct technical support to WSUG where

necessary. Major repairing which require special equipment and/or special well technology VWC shall call commercial repairing company. In case, there is no commercial repairing company, VWC request implementing agency to introduce private repairing company.

It is required formulation of sustainable spare parts procurement system within a project period.

Chapter3 Project Evaluation and Recommendations

Chapter 3. Project Evaluation and Recommendations

3-1 Project Effect

The project aims to "construct water supply facilities to provide safe water to beneficiaries living in 26 villages in the Mwanza region and 18 villages in the Mara region, for a total of 44 villages," with the following project effect.

Table 3-1: Project Effect

Current condition and problems	Project actions/ countermeasures	Direct effects and degree of improvement	Indirect effects and degree of improvement
• Average water supply rate is 51% in the Mwanza region and 45% in the Mara region (2005). It is lower than the nationwide average of 52% (2005)	• Construction of deep well with hand pump and spring protection	• Increase population with access to safe water by 45,750 capita (2020) • Increase Water supply population from 9,401 capita to 55,151 capita in project area	• Provide safe and stable water to beneficiaries • lighten work load for fetching water by children and woman
• Slow progress of transferring utilization from unsanitary shallow well to deep well with hand pump due to lack of hygiene knowledge	• Accelerate utilization of clean water which come up from deep well by hygiene education program	• Upgrade ownership and hygiene knowledge of beneficiaries	• Improve sanitation conditions and decrease water borne disease
• Insufficient management capability for accounting, from fee collection to O&M payment	• Secure collection of water fees for covering O&M cost	• Formulate O&M planning such as user regulation and response for maintenance and repair, and special consideration for the economically disadvantaged.	• Provide safe and stable water to beneficiaries
• Insufficient organization for hand pump repair	• Make clear the role of repairing and its implementing	• Conduct adequate and sustainable O&M management	• Provide safe and stable water to beneficiaries
• Insufficient support capability for O&M management by the implementing agency	• Conduct Soft component activity which included establishment of organization, strangeness of O&M formation and hygiene education for sustainable utilization of the facilities	• Formulate beneficiary-centred O&M management through clarified roles for concerned personnel and mutual cooperation.	• Provide safe and stable water to beneficiaries

3-2 Recommendations

3-2-1 Recommendation for Tanzanian Side

(1) Secure the budget and staffs by Tanzania side

It is required that secure the budget and staffs for implementation of the project and soft component activity.

(2) Positive participation of DWE and RWA staffs to the project

Currently, hygiene education and operation and maintenance training were conducted when facility construction work implemented by the Swedish aid organization. Some of the villagers are still maintain O&M activity in the target village. However the staffs who are working under DWE are unknown about the current project. Positive participation of DWE and RWA staffs to the project is recommended for strengthens of the rural water supply project.

(3) Contribution of the project by beneficiaries participation

In order to sustainably utilize water supply facility, beneficiaries obtain ownership through participation of the project. Minor works such as installation of the fence around water supply facility and construction of the drainage ditch are planed in this project for the way of building ownership. Obtaining the beneficiaries' ownership is required through participation of the project connection with DWE and RWA.

3-2-2 Technical Cooperation and Partnership with Other Donors and NGOs

(1) Relationship with Technical cooperation

Soft component activity will be conducted as an initial guidance in this project for improvement of operation and maintenance capacity. However activity for improvement of O&M is limited due to limited of the project period. In order to entrench in O&M management to DWE and RWA staffs, it is required to advice and monitor improvement activity in medium-range. It is recommended to conduct the medium-range technical cooperation like a "the Rural Water Supply and Sanitation Capacity Development Project (RWSS-CAD) in Lindy and Mtwara region".

(2) Partnership with other donors and NGOs

The rural water supply project is executed based on Water Sector Development Program (WSDP) in Tanzania. Other donors who are euro national and united state of America are following Basket Fund System. Basket fund system is put in fund form donors into Tanzania government account and the project is selected by the cabinet office and implementing by the Tanzania side utilizing such fund. On

the other hand, Japan is conducting support following "aid with a human face" policy, then support is implementing based on the recipient country's request. It is required cooperation between Basket fund project and Japanese Grant Aid project for target area and policy of support.