MINISTRY OF WORKS AND HOUSING
THE REPUBLIC OF GHANA

BASIC DESIGN STUDY REPORT ON THE PROJECT FOR RURAL WATER SUPPLY PHASE-III IN THE REPUBLIC OF GHANA

MARCH 1996

JAPAN INTERNATIONAL COOPERATION AGENCY
SANYU CONSULTANTS INC.

BASIC DESIGN STUDY REPORT ON THE PROJECT FOR RURAL WATER SUPPLY PHASE-III IN THE REPUBLIC OF GHANA MARCH 1

BASIC DESIGN STUDY REPORT

ON

THE PROJECT

FOR

RURAL WATER SUPPLY PHASE-III

IN

THE REPUBLIC OF GHANA

MARCH 1996

JAPAN INTERNATIONAL COOPERATION AGENCY

SANYU CONSULTANTS INC.

Preface

In response to a request from the Government of the Republic of Ghana , the Government of Japan decided to conduct a basic design study on Rural Water Supply Phase III and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Ghana a study team from 21 October to 19 December, 1995.

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

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

I wish to express my sincere appreciation to the officials concerned of the Government of the Republic of Ghana for their close cooperation to the teams.

March 1996

Kimio Fujita
President
Japan International Cooperation Agency

April 1996

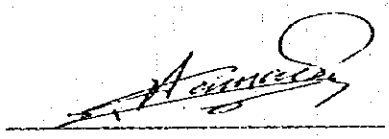
Letter of Transmittal

We are pleased to submit to you the basic design study report on Rural Water Supply Phase III in the Republic of Ghana.

This study was conducted by Sanyu Consultants Inc., under a contract to JICA, during the period from October 16, 1995 to March 29,1996. In conducting study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Ghana and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

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

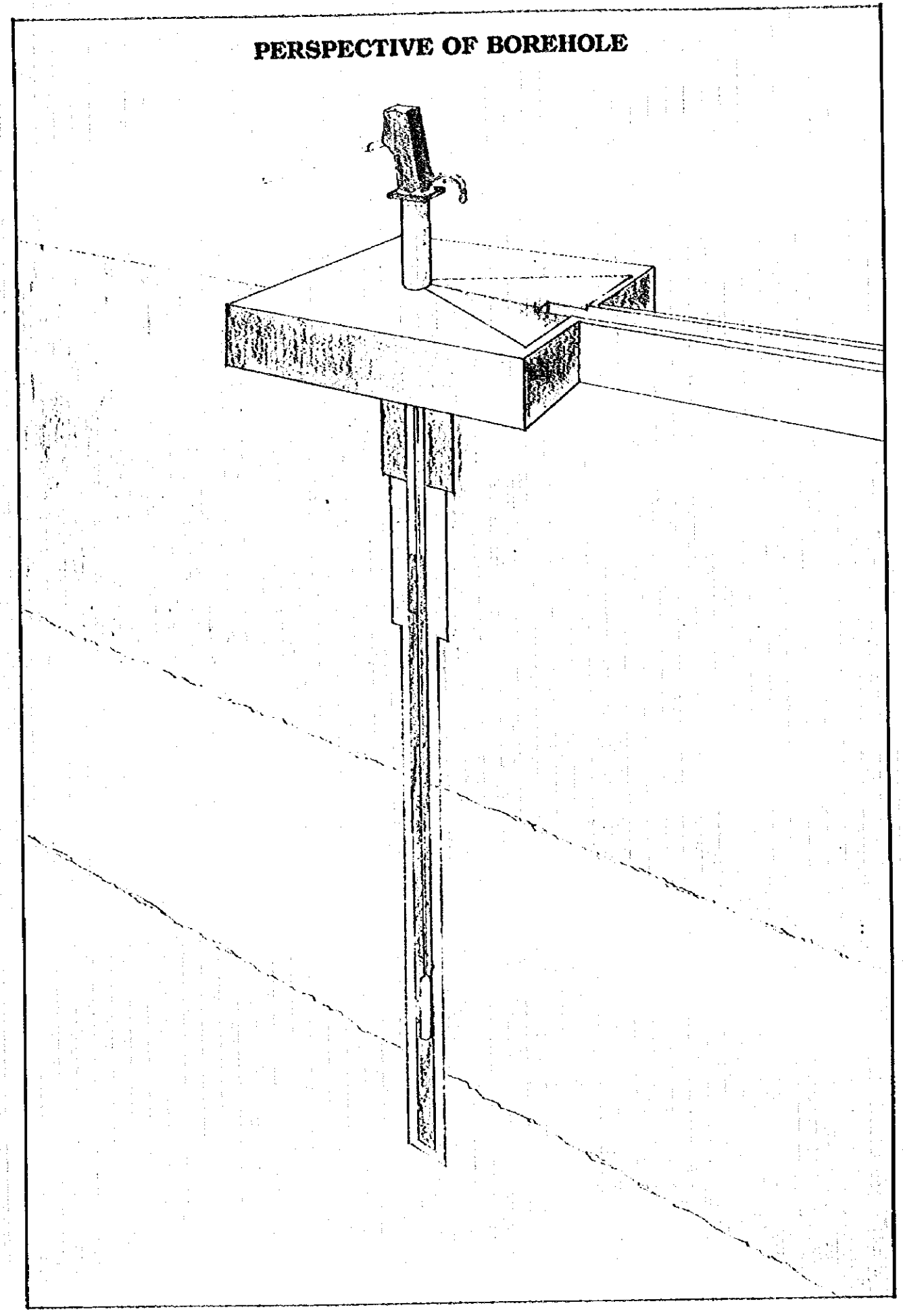
Very truly yours,



Iwao Hamada
Project manager,
Basic design study team on
Rural Water Supply Phase III,
Sanyu Consultants Inc.

Location Map of Project Areas

PERSPECTIVE OF BOREHOLE



Abbreviations

CCCE : Caisse Central de Co-operation Economique
CFD : Casse Francise Develppement
CIDA : Canadian International Development Agency
CWSD : Community Water and Sanitation Division
DANIDA : Danish International Development Agency
DTH : Down-The-Hole Hammer
D/U : Drilling Unit
E/N : Exchange of Notes
ERP : Economic Recovery Programme
FC : Foreign Currency
GE : Geo-Electric Sounding
GOG : Government of Ghana
GTZ : Gesellschaft fur Technische Zusammenarbeit
GWSC : Ghana Water and Sewerage Corporation
IDA : International Development Association
JICA : Japan International Cooperation Agency
Kfw : Kreditanstalt fur Wiederaufbau
LC : Local Currency
NGO : Non-Government Organization
ODA : Official Development Assistance
SIP : Strategic Investment Plan
UNDP : United Nation Development Programme
WHO : World Health Organization

Basic Design Report
Project For Rural Water Supply Phase III
In The Republic of Ghana
Contents

Chapter 1 Background of the Project

In the later half of 1980, Government of Ghana continuously planned Economic Recovery Programme Phase II placing Phase I in order to improve economic management and its organization for middle term economic recovery with social infrastructure maintenance and regional differential dissolution. GWSC, therefore, planned Recovery Development Programme (RDP, 1987 - 1991) including Operation Sparkling Groundwater Plan and started the construction of 6,000 boreholes as a part of the plan. The project for rural water supply phase I and II assisted by Japan were designed under the RDP.

Ministry of Works and Housing has Policies and Guidelines (January 1994) and Strategic Investment Plan (March 1994, SIP) for National Community Water Supply and Sanitation Programme in order to cut the maintenance cost.

Water supply to 80 % of the rural population by 2004 would be achieved through the construction of approximately ;

(a) 27,800 dug wells,
(b) Construction of 16,000 new boreholes with rehabilitation,
(c) Rehabilitation of 500 water systems, and
(d) Development of 1,000 additional water sources such as spring and rain water catchments.

CWSD intends to shift away the water and sanitation sector from the dependency on Government to a Community Demand Driven Approach by introducing community management and ownership of the water supply facilities.

Ghana Government has requested the Government of Japan for the rural water supply project phase III. The main contents of the project is construction of 1029 borehole construction and procurement of equipment for the construction in Grater Accra and Eastern Regions as a part of 16,000 borehole construction plan under SIP.

Owing to the above facts, JICA has conducted a preliminary study from June to July 1995. Following the discussions with Ghana side, it was decided that the project area will cover 10 districts of the Regions. And JICA will study to allocate 450 boreholes among the districts based on the criteria for community selection in addition to overhaul drilling rigs with other equipment and procure materials in basic design study stage.

Details of the study are as follows;

(a) Design of 450 borehole construction,

(b) Procurement of equipment for community educational activities,

(c) Overhaul of drilling rigs with equipment,

(d) Procurement of spare parts for the equipment, and

(e) Consulting services.

Chapter 2 Contents of the Project

2-1 Objectives of the Project

This project has been designed under the National Community Water and Sanitation Programme. The main objectives of the Programme as outlined in the Strategic Investment Plan (SIP) and the Policies and Guidelines are explained below.

(1) Strategic Investment Plan (SIP)

The main objective of the Strategic Investment Plan (SIP), which was adopted by the Ministry of Works and Housing of the Republic of Ghana (hereinafter called "The Ministry ") in March 1994, is to have the communities carry out operation and maintenance of water supply facilities by vesting in them the ownership of the facilities through the community demand-driven approach.

The goal of the SIP is to increase the rural water supply coverage to 80% by the year 2004 through (1) constructing 16,000 new boreholes and 27,800 dug wells ; (2) rehabilitating 500 water supply facilities; and (3) developing 1,000 new water supply sources.

(2) Policies and Guidelines

The highlights of the Policies and Guidelines of the Programme are as follows:

To provide basic water services of 20 liters per capita per day (l/cd) to the communities having 75 residents or more provided that they can contribute toward the capital costs of constructing the water supply facilities and are also able to bear the expenses for year-round operation and maintenance.

To sustain the water supply facilities by the private sector through the provision of spare parts and the technical support from the public sector.

To improve the health conditions of the residents through education on drinking water and hygiene.

(3) Objectives of the Project

As a part of the measures toward the achievement of the objectives of this Programme, the Government of Ghana with assistance from the Government of Japan, plans to construct 450 boreholes and to procure the equipment necessary for its execution in the Eastern and Greater Accra regions under this Project.

This Project will ensure accelerated coverage from 51 % to 62 % of the rural population in the Grater Accra Region and from 29 % to 44 % of the population in the Eastern Region.

And also the Project can provide a community ownership and sustainable management of the water supply facilities through the sanitary education and establishment of a water point committee conducted by the community education activities.

2-2 Basic Concepts of the Project

The basic concepts of the Project are as follows:

(1) Using the selection criteria agreed upon during the previous mission, 73 communities out of 368 originally planned have been disqualified. Consequently, 295 communities (368 - 73 = 295) will be considered under this project. The number of successful boreholes will remain unchanged and distributed among 295 communities by considering the population and other factors. The number of communities in each district is shown below (Table 2-1).

Table 2-1 Number of communities in each district

District	Number of communities planned	Number of communities selected
GA	33	29
DANGBE WEST	10	17
ASUOGYAMAN	30	28
WEST AKIM	30	26
YILO KROBO	31	23
MANYA KROBO	100	73
EAST AKIM	35	27
SUHUM/KRABOA/COALTAR	40	30
FANTEAKWA	29	27
KWAEBIBIREM	30	15
TOTAL	368	295

(2) By analyzing the results of site study and the collected materials, the project areas is divided into five hydro-geological zones. The total number and the total depth of boreholes to be drilled will be determined by estimating hydrogeological factors including the success rate for each hydro-geological zone.

(3) For the hand pumps, both Ghana-modified India Mark II and NIRA (AF85) types, which are approved in Ghana, will be used. The numbers of these two types of pumps to be used will be determined based on the results of the pumping test and the seasonal fluctuation of the groundwater level.

(4) As outlined in the National Programme, the community demand-driven approach is being implemented in foreign aid projects such as those of Canada and France. A Water Point Committee has been established in each community through the community education activities in order to ensure a sustainable operation and maintenance of water supply facilities. The same approach will be adopted on this project.

(5) In order to conduct the community education activities throughout the project area, three groups must be organized. To establish the operation and maintenance system, Water Point Committees must be organized for 450 borehole facilities, and an Area Mechanic for pump repairs must be engaged. Also, spare parts shops must be established for each area. By considering these points, the details of the equipment for community education and the operation and maintenance of boreholes will be determined.

(6) The prime contractor for the construction of boreholes will be a Japanese firm.

(7) The contractor will render the repair services for GWSC's drilling equipment to be used for borehole construction works. The contractor will also provide technical training to the drilling staff assigned from GWSC.

(8) Two sets of drilling equipment out of four will be repaired and used by the Japanese contractor considering that the other two sets are required for emergency purposes and other drilling operations under GWSC projects.

(9) Six drilling rigs will be required in total in order to complete the construction of boreholes on schedule : two from GWSC and four from local contractors.

2-3 Basic Design

2-3-1 Design Concept

(1) Natural Conditions

a. Location of Drilling Sites

Drilling sites will be directed by the CWSD staff or the consultant, based on the results of the geo-electric prospecting conducted by the consultant within a community or within a 500 meter radius of that community.

b. Determination of Borehole Depth

Based on the results of borehole construction in the Eastern region under the 3,000 boreholes project funded by Kfw and the initial geo-electrical survey conducted during the basic design stage for this project, average drilling depth and success rate in each of the 5 hydrogeological zones are estimated as in Table 2-2 below.

Table 2-2 Borehole depth of each hydro-geological zone

Hydro-geological zone	Stratum	Main rocks	Average borehole Depth
Zone 1	Voltaian Group	Sandstone, shale	55 m
Zone 2	Togo-Beum Group	Volcanic rocks	60 m
Zone 3	Dahomean Group	Gneiss, Porphyry	55 m
Zone 4	Cape Coast Granite Complex	Granite	40 m
Zone 5	Birimian Group	Lava, Schist	50 m

Casing length of a borehole shall be the borehole depth with an additional 0.5 meters.

c. Borehole Plan

GWSC standards for borehole structure and its appurtenant facilities will be adopted for a borehole plan of the Project.

d. Success Rate and Total Number of Drillings

Base on the results of borehole construction in the Eastern region under the 3,000 boreholes project funded by Kfw and hydrogeological conditions in the project area, the success rate and total number of drillings are determined in each hydrogeological zone as shown in Table 2-3 below.

Table 2-3 Success Rate and Total Numbers of Drilling

Hydrogeological zone	Success rate (a)	No. of borehole planed (N)	No. of unsuccessful borehole (n) n = N x (1-a)	No. of drilling in max. (N + n)
Zone 1	80 %	161	33	194
Zone 2	80 %	53	11	64
Zone 3	50 %	27	14	41
Zone 4	80 %	134	27	161
Zone 5	85 %	75	11	86
	-	450	96	546

e. Criteria for a Successful Borehole

A drilled borehole is accepted as a successful borehole in cases where the yield and water quality fulfill the GWSC criteria as shown below:

1. GWSC standards for borehole yield : 13.5 liters / min.
2. GWSC standards for water quality designation

f. Quantity of handpumps

Two types of handpumps (low and high lift types) are adopted for this project. The low lift type is adopted when the pumping head is less than 15 meters, while the high lift type is selected when the pumping head is 15 meters or more.

A ratio of the low and high lift types is calculated in each hydrogeological zone as shown in Table 2-4 below.

Table 2-4 Quantity of Handpumps

Hydrogeological zone	No. of boreholes planned	Ratio of low lift type (%)	Ratio of high lift type (%)	Quantity of low lift type	Quantity of high lift type
Zone 1	161	0	100	0	161
Zone 2	53	0	100	0	53
Zone 3	27	0	100	0	27
Zone 4	134	46	54	62	72
Zone 5	75	53	47	40	35
	450	-	-	102	348

In consideration of increasing numbers of the high lift type, the quantity of both the handpumps is determined as shown in Table 2-5 below.

Table 2-3 Number of Pump by Type

Type of Pump	Ratio (%)	Planned number of pumps
Low lift type	20	90
High lift type	80	360

g. Materials for Overhaul of Drilling Rigs

Four drilling rig units with four sets of compressors have been supplied from Japan for the rural water supply project phase 1 and 2. Two of the four units will be repaired by procurement of spare parts and assemblies from Japan in this project. While one of the four sets of compressor must be newly procured, because repairs are difficult.

Procurement of some compressors is available through local agents in Ghana so that the procurement will be determined after a study for the prices, specifications and delivery of the compressors in Ghana.

h. Procurement of Lightweight Vehicles

It is possible to procure lightweight vehicles, which are used for community education activity and drilling work made in Japan and Europe through local agents in Ghana. The procurement will be determined after a study of prices, specifications and delivery of the compressors in Ghana

i. Materials for Community Education Activities

The selection of materials for community education activities in Ghana has not yet been completed. The materials (TV sets, slide projections, video camera and etc.) should be used on a compatible system for better operation so that the materials can be procured in Japan.

j. Determination of the construction period for boreholes

The average monthly rainfall in this project area is 100 mm or more and the number of rainy days in a month is about 15 days during the period from the end of May to the beginning of October. Because of this rainfall characteristic, rural roads and borehole construction sites become inaccessible causing difficulties for the movement of heavy vehicles. Accordingly,

the construction period for boreholes in this project is estimated to be seven months from the middle of October to the middle of May.

(2) Social Conditions

Hygiene education, which will be conducted as a part of community education activities, will be reflected in the design of this project in order to increase the awareness of residents so as to help them understand better the need for a stable supply of potable water and its link with healthy living. These community activities play extremely important roles in introducing the community management system for water supply facilities, which is the main objective of the National Programme. By considering these points, an organization responsible for the operation and maintenance of community water supply facilities will be established.

In order to improve the awareness of residents, the community education teams will visit the communities and conduct hygiene education by using visual equipment in several days. The team is necessary to provide a translator for English into various tribes' languages who will introduce the objectives of education to the residents, especially children. It is, therefore, considered that a local contractor will be mobilized for these activities.

With regard to the local consultants to conduct the community education activities on site, the following six organizations were listed by CWSD:

1. Rural Information and Community Network (RINCON)
2. Water and Sanitation Health Team (WASHT)
3. IFM Environment and Development Consultancy Limited (IFMED)
4. Kumasi Health Education Unit (KHEU)
5. Centre for Integrated Rural Environmental Development (CEFRIEND)
6. Centre for the Development of People (CEDEP)

Because CWSD has difficulty in implementing the community education activities due to lack of funds and human resources, some of the above consultants will also be utilized for the activities.

(3) Conditions of Construction

The equipment that can be procured in Ghana includes handpumps, PVC casings and screens, lightweight vehicles, and materials for construction of boreholes. All this equipment has been used on other projects without any quality problems. In addition, because there are distributors or manufacturing companies for all this equipment in Ghana, spare parts could be provided promptly. Therefore, the equipment that is available in Ghana will be procured locally.

(4) Use of local drilling contractors

Although there are a few well drilling contractors in Ghana, the abilities of GEOMECHANIK and JIMPEX, both of which have headquarters in Accra, seem to be more suitable than the others. This could be deduced from their construction work, years of experience, and their technical ability.

(5) Maintenance and Management by Execution Agency(CWSD)

CWSD fulfills its function of an execution agency for the community water supply schemes in Ghana under the assistance of foreign and international organizations. The water point committee must continuously perform the maintenance and management of the facilities, while a District Water and Sanitation Team (DWST) carries out monitoring and providestechnical advice to the committee. Equipment of DWST is insufficient for its activities. Some bikes will, therefore, be procured for transportation in the Project. The DWST's knowledge will be improved to a higher level of monitoring due to a consultant's assistance throughout the project.

(6) Quality of Facilities and Equipment

Boreholes are constructed within a community or within a radius of 500 meters of the community because of convenience of the residents.

Borehole structure and appurtenant facilities will be designed with reference to the GWSC's design standard.

Spare parts and assemblies for drilling rigs to be repaired must be selected from the same manufacturer of the rigs. It is considered that the manufacturer shall dispatch technicians for detailed overhaul of the rigs as technical assistance.

Drilling tools to be procured must adopt the drilling equipment supplied in phases 1 and 2.

The compressor, vehicles and handpumps will be specified in detail condition.

Equipment and materials will be selected giving priority to local procurement as long as their quality and quantity is adaptable for the project.

It is considered that the difficulty in procuring spare parts is one of the diterminants for selection of equipment.

(7) Policies on the construction period

Because the borehole site selection work mentioned above and the number of boreholes to be constructed are large in scale, this project must be implemented in two stages as shown in Table 2-4 below.

Table 2-4 Contents of the projects for each stage

Stage	Contents of the project
Stage I	1. Detail design 2. Procurement of equipment including handpumps 3. Community education activities 4. Geophysical exploration
Stage II	1. Detail design 2. Procurement of handpumps 3. Community educational activities 4. Geophysical exploration 5. Construction of boreholes 6. Overhaul of drilling rigs

The implementation period of each activity and the number of days are calculated below.

a. Period to procure the equipment

Lightweight vehicles are to be procured in Ghana because they are available locally. The community education activities which need long periods of time must be started as early as possible. The procurement period is expected to be two months.

Handpumps are to be procured in Ghana because there are local dealers and/or manufacturing firms . The procurement period is expected to be five months because the dealers must procure handpump parts from India, Sweden, or the USA. An additional two-month period is needed for transportation.

The equipment required for the rehabilitation of drilling rigs must be procured from Japan because all of them are to be manufactured in Japan. Five months will be required for procurement and two months for transportation.

b. Duration of community education activities

The community education activities must be conducted in about 295 communities. Because these activities require a minimum of five days par community, it is estimated that 59 months would be required to complete these activities. According to the implementation schedule, three groups are needed to conduct these activities. Then the duration necessary for these activities at each Stage is as shown in Table 2-5 below.

Table 2-5 Duration to conduct community education activities

Stage	Duration (months)	Number of communities
Stage I	4.5	68
Stage II	15.0	227
Total	19.5	295

c. Duration of geophysical exploration for borehole site selection

The borehole site selection by geophysical exploration must be conducted at 450 sites in these 295 communities. By assuming about 2.6 days per site, 47 months are required. If the site selection is conducted by two groups, it would take 23.5 months. According to the implementation schedule, four months can be used for this activity in Stage I and 19.5 months in Stage II as shown in Table 2-6.

Table 2-6 Duration of the geophysical exploration

Stage	Duration (months)	Number of sites
Stage I	4.0	77
Stage II	19.5	373
Total	23.5	450

d. Duration of borehole construction

The duration of borehole construction is estimated according to the following conditions.

Condition 1 : Construction of boreholes will be in combination of (1) by subcontract with local contractors and (2) by the Japanese contractor involving equipment and personnel of D/U.

Condition 2 : The number of working days for constructing one borehole involving the local contractors is assumed to be 3.5 days/borehole.

Condition 3 : The number of working days for constructing one borehole when using D/U is assumed to be 5.2 days/borehole.

Condition 4 :The number of boreholes to be constructed using local contractors is assumed to be 330.

Condition 5 : The number of boreholes to be constructed involving D/U is assumed to be 120.

From the above conditions, the following are determined.

- The total number of days to construct boreholes using local contractors : 1155 days (46.2 months)
- The total number of days to construct boreholes by D/U : 624 days (25 months)

Assuming that the numbers of drilling rigs to be used are four and two respectively, the duration necessary for borehole construction becomes 12.5 months as shown in Table 2-7 below.

Table 2-7 Duration to construct boreholes and number of boreholes to be constructed for each Stage

Stage	Duration (months)	Number of boreholes
Stage I	0	0
Stage II	12.5	450
Total	12.5	450

2-3-2 Basic Design

(1) Borehole Construction

The planned borehole construction is shown below.

a. 50 boreholes are constructed in the Greater Accra Region.
b. 400 boreholes are constructed in the Eastern Region.
c. 450 boreholes are constructed in total.
d. Borehole depth is 50 meters on average.
e. Borehole depth is a maximum 70 meters.

(2) Borehole plan

The borehole facilities must be constructed so that clean drinking water can be obtained for long periods of time on a stable basis. In other words, all the boreholes must be properly constructed according to approved standards and specifications. The standard designs and specifications are shown in Figure 2-1.

(3) Appurtenant facilities of boreholes

As for the appurtenant facilities of the boreholes, concrete slabs 2.6 x 1.2 m in dimensions with a thickness of 30 cm will be constructed for easy cleaning and maintenance as well as to prevent the direct penetration of surface water into boreholes. To keep the surroundings of each borehole clean, a drainage pit will be installed at a spot 7 m or more from the center of the borehole and a concrete drainage channel will be installed between the borehole and the drainage pit. The details are shown in Figure 2-2.

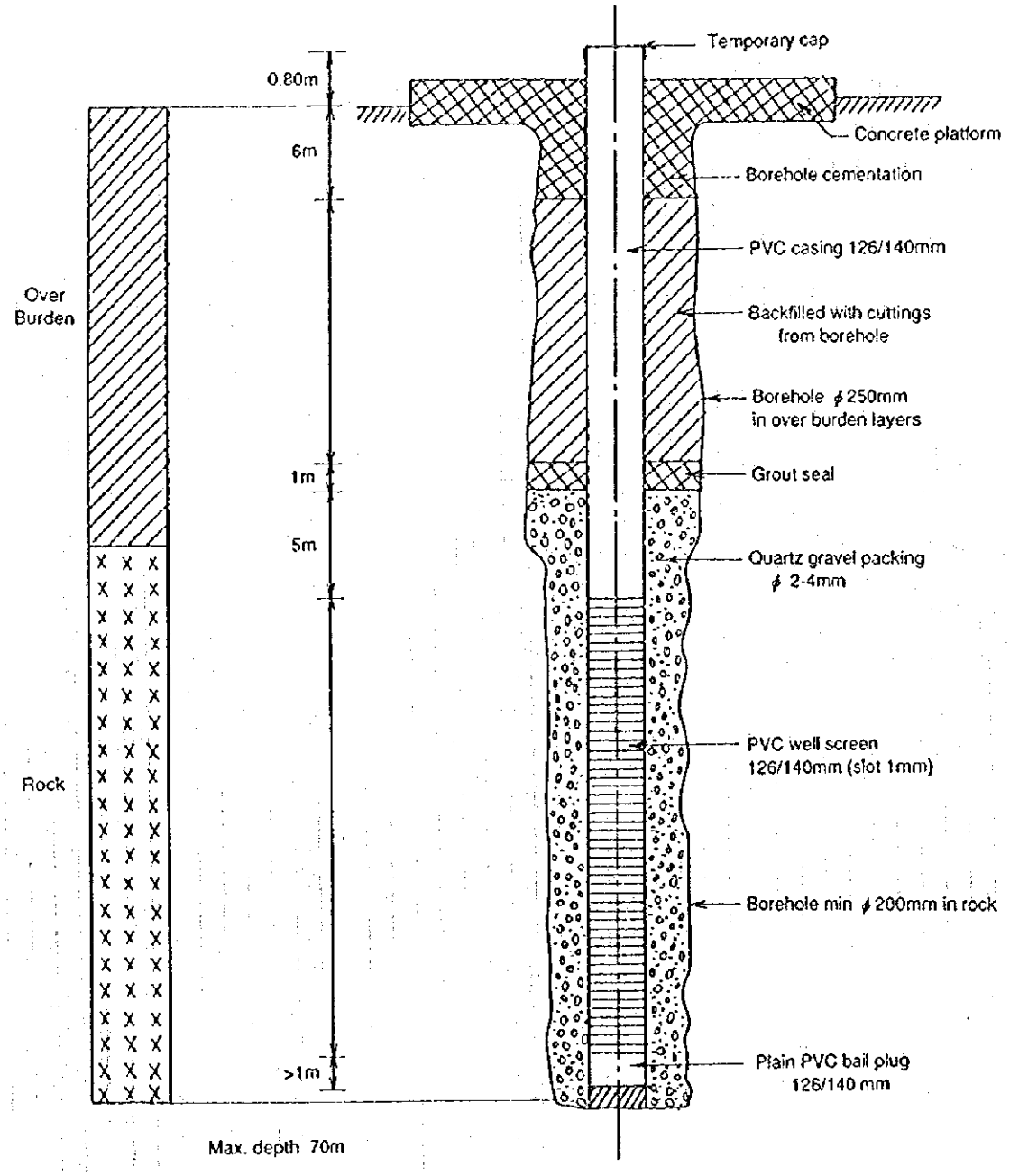


Figure 2-1 Design of Borehole

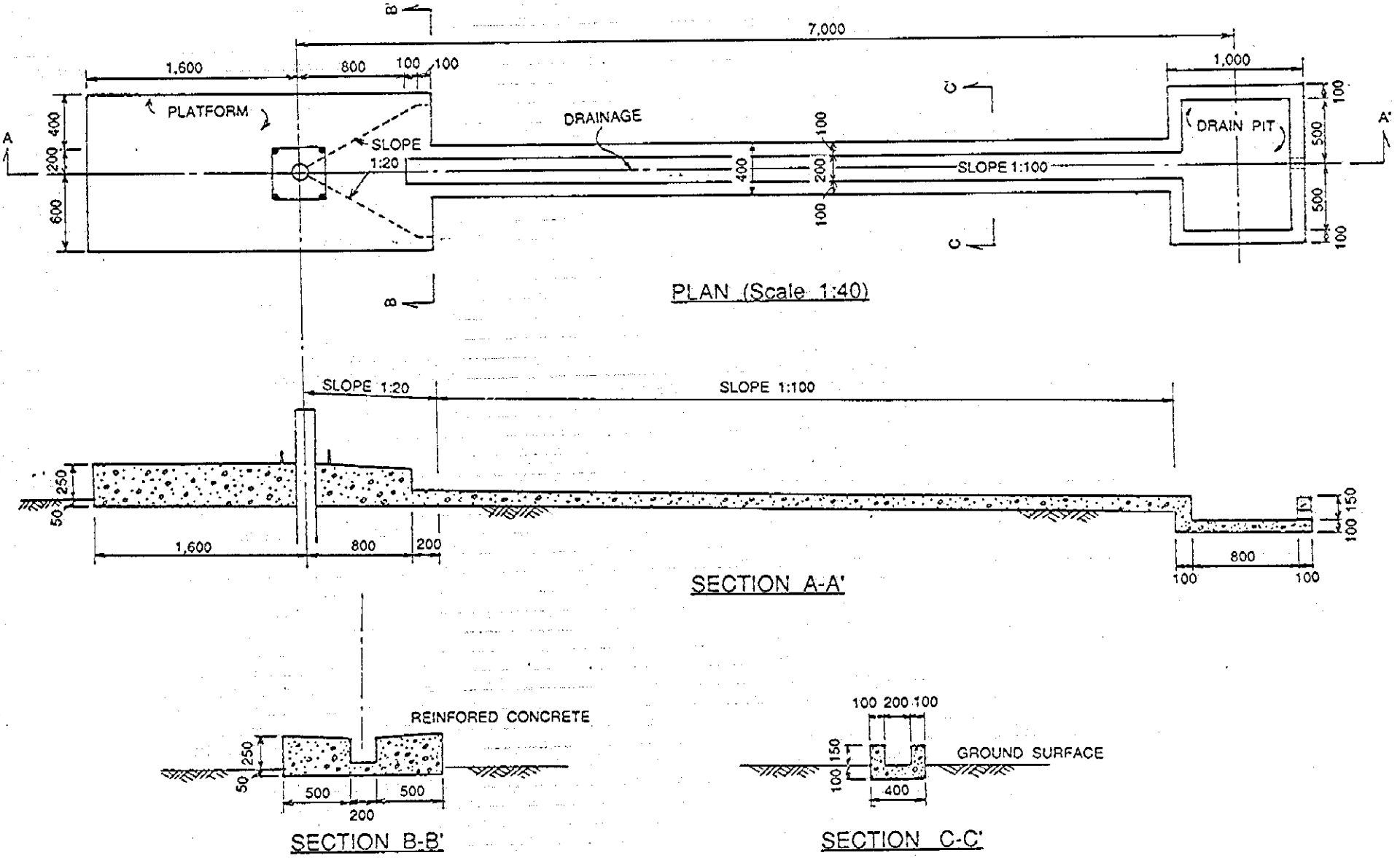


Figure 2-2 Design of Appurtenant Facility

(4) Equipment plan

The equipment to be procured in this project is composed of spare parts for repair of two sets of drilling rigs owned by GWSC and the equipment necessary for implementing the project is shown in Table 2-8 below.

Table 2-8 Details of equipment

1. Spare parts for repair of two rigs	2 sets
2. Materials, equipment and spare parts for borehole construction	
Handpumps	450 sets
High pressure compressor	1 unit
Cargo truck with 2-ton crane	1 unit
Four-wheel drive station wagon	2 units
Four-wheel drive pick-up truck	2 units
Drilling tools and materials for borehole construction	1 unit
Borehole testing equipment	1 set
Two-year worth of spare parts	1 unit
3.Other Equipment	
A. Equipment for community education activities	
Four-wheel drive double cabin pick-up truck	3 sets
Television sets	3 sets
Loudspeaker	3 sets
Slide projector and accessories	2 sets
Video camera, accessories, and films	2 sets
Motorbike	6 units
B. Equipment for the operation and maintenance of boreholes	
Equipment for area mechanics	
Motorbike	20 units
Repair tools	20 sets
Tools for pump caretaker (wrench set)	
Daily inspection tools	450 sets

Specifications and amount of equipment to be procured in this project are explained below.

1) Handpumps: 450 sets

For handpumps, both the Ghana modified India MKII, which is one of the CWSD-approved pumps for high lift pumping and the NIRA (AF85) type for low lift pumping of 15 m shall be used together.

Ghana modified India MKII : 360 sets (with pumping pipe of 36 m per pump)
NIRA (AF85) type : 90 sets (with pumping pipe of 18 m per pump)

2) Materials, equipment, and spare parts for borehole construction

a. Procurement of high-pressure compressor: one (1) unit

In order to replace the compressor which was procured in Phase I of the pervious project and has become unusable due to wear-and-tear, one new high-pressure compressor is to be procured. The required capacity of air pressure for the new compressor will be 20 kg/cm^2 while the output capacity will be 22 m^3/min. taking into account the borehole diameter of 200 mm.

b. Procurement of new vehicles

The number of vehicles to be procured are as follows:

- 4-ton cargo truck with 2-ton crane : 1 unit
- Station wagon (for transporting workers) : 2 units
- Pick-up truck (for transporting the equipment) : 2 units

c. Procurement and quantity of drilling tools and materials for borehole construction

The types and quantity of the drilling tools required in the course of drilling of 120 success boreholes are shown in Table 2-9.

Table 2-9 List of tools to procure

Item	Dimension	Unit	Amount
DTH hammer		Set	4
Hammer bit	8-1/2 inch	Piece	24
Tricone-bid	12-1/4 inch	Piece	2
Tricone-bid	10-5/8 inch	Piece	23
Tricone-bid	8-5/8 inch	Piece	2
Bid-sub	6-5/8 inch	Piece	4
Bid-sub	4-1/2 inch	Piece	4
Hammer-sub	3-1/2 inch	Piece	6
Tools for hammer		Set	1
Work casing	10 inch, 1 m	Piece	2
Work casing	10 inch, 3 m	Piece	20
Materials for borehole construction	PVC casing: mud agencies	Set	1

2-5 Procurement of borehole testing equipment

Because the well logging device and the pumping test-set necessary for the determination of screen depth are unusable or entirely worn-out, the following equipment must be procured for this project.

- Well logging device 1: Automatic-recording, capacity of 200m, resistivity, spontaneous potential
- Pumping test set 1 : Underwater motor pump (with pumping head of 80 meters or more, pumping capacity of 100 l/m, 1 set of accessory including the pumping pipes and valves), water gauge
- Generator 1 : 10 KVA

3) Procurement of equipment for the community education activities and the equipment for operation and maintenance of the community water facilities

3-A Equipment for community education activities

In order to mobilize the community education activities and organize the Water Point Committee in communities, the following set of equipment will be procured.

- Vehicles to transport the video equipment (a pick-up truck, a four-wheel drive car, and a double-cabin car) : 3
- Motorbike : 6
- Television sets (21-inch) : 3
- Video-cassette recorders with standard accessories : 3
- Generators (2.7 KVA) : 3
- Loud speakers (to be mounted on vehicles) : 3
- Micro-slide projectors with standard accessories : 2
- Video cameras, standard accessories, and films : 2

3-B Procurement of equipment for the operation and maintenance of community water supply facilities

In order to strengthen the community management and maintenance of the completed facilities, the following equipment will be procured for the area mechanics and Water Point Committee of each area.

- Motorbike : 20
- Handpump repair tools : 20 sets (pipe wrenches, spanners, grease guns)
- Tools for daily inspection of handpumps : 450 sets (wrench set))

4) Rehabilitation of existing drilling equipment

The following equipment will be repaired:

- Trucks of drilling rigs (2 units) : Engine and transmission
- Drilling rigs (2 sets) : Jack, feed cylinder, swivel head, main drum, pump, and parts for hydraulic pipe
- Mud pumps (2 sets) : Gear box, piston, and liner
- Compressor (1 unit) : Engine (for one compressor. One new compressor will be procured.)
- 5-ton truck with crane (2 units) : Engine, transmission, and instrumentation
- Water Tank Truck (1 unit) : Engine and transmission

(5) Spare parts: 1 set

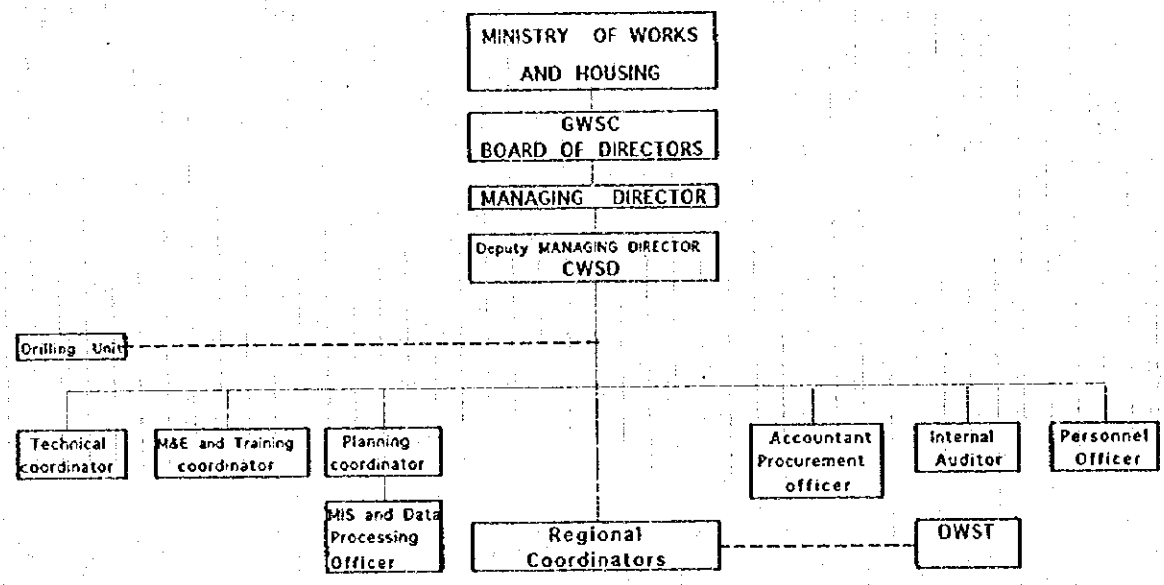
One set of spare parts is to be procured for the repair of the above-mentioned equipment.

2-4 Implementation system of the project

2-4-1 Organization

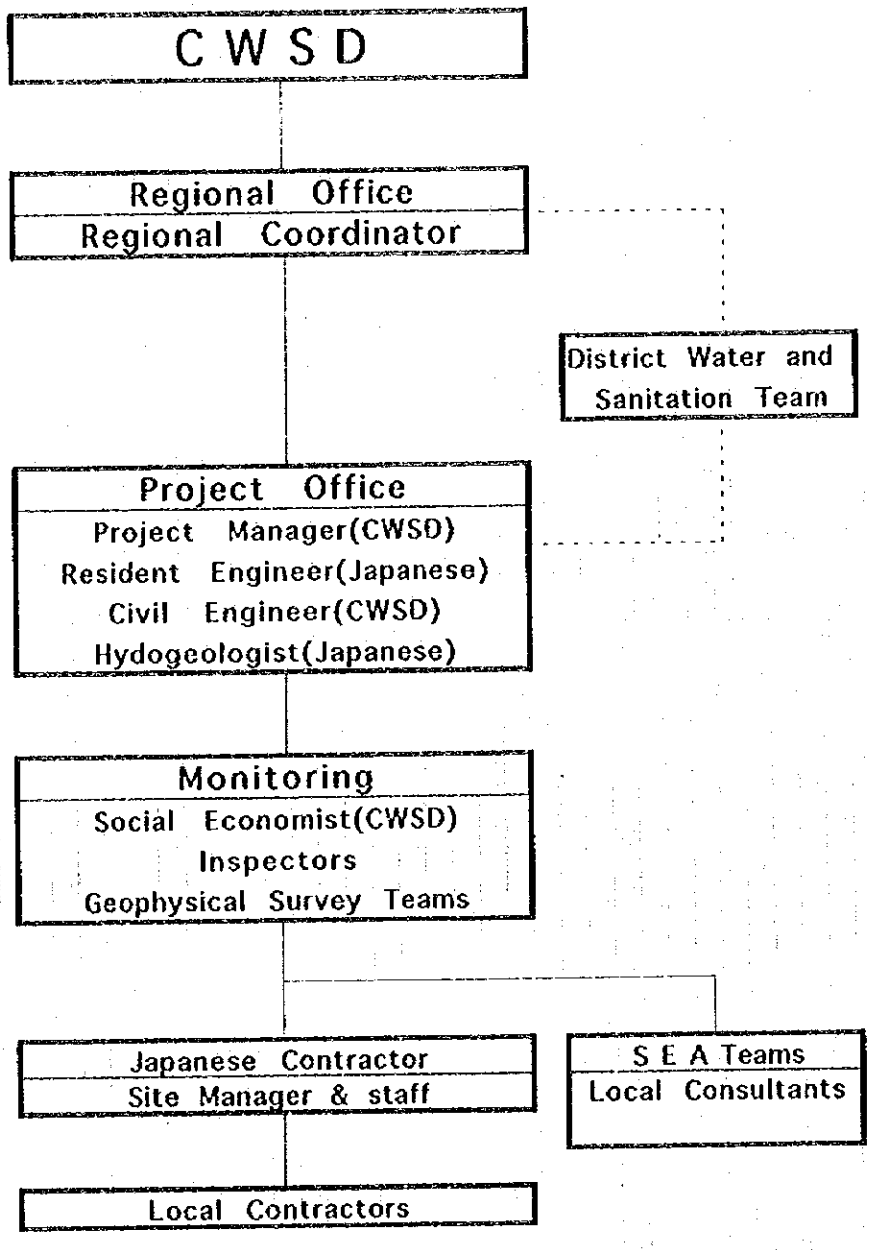
The government ministry responsible for implementation of the project will be the Ministry of Works and Housing, while CWSD which is one of the two divisions of Ghana Water and Sewerage Corporation (GWSC) will be the implementing agency of this project. CWSD is in charge of planning, implementation and procurement of external funding for rural water and sanitation projects throughout the country. It has offices in ten regions and each of them is responsible for management of the rural water and sanitation project in the respective region. In addition, CWSD sets up District Water and Sanitation Teams (DWST) which function for the community education activities and also monitoring the operation and maintenance for the water supply facilities. Figure 2-3 illustrates the organization of CWSD.

Figure 2-3 Organizational Structure



This project will be effectively carried out by the above-mentioned CWSD organizational structure and using the project management structure shown in Figure 2-4.

Figure 2-4 Rural Water Supply Project Management Structure



2-4-2 Budget

As shown in Table 2-10, 160 million cedis were appropriated for 1994, 1.1 billion cedis for 1995, and 907 million cedis for 1996 to invest in the community water and sanitation projects of CWSD in the three year public investment plan from 1994 to 1996, which is prepared by the Ministry of Finance and Economic Planning. These three investment figures account for only 5%, 26%, and 14% of investment by foreign donors.

Table 2-10 Expenditure Plan (1994 to 1996)

Plan	Expenditure plan (in million cedis)									
	1994		1995		1996		Deficiency		Total	
	FC	LC	FC	LC	FC	LC	FC	LC	FC	LC
1. Rehabilitation of existing boreholes (UNICEF)	10	20	16	33		29			26	82
2. Rural water supply project (Japan)	1,490	20	1,176	240	1,917	212	9	982	4,592	1,454
3. Repair of shallow boreholes (Germany)	158	10	232	43		26			390	79
4. Construction of shallow boreholes (GOG)		20	569	81	158	227	481	1,115	1,208	1,443
5. Hand pump project (the World Bank)			50	55					50	55
6. Rural water supply project in Central region (France)	1,422	30	1,075	348	2,780	212	5,773	2,375	11,050	2,965
7. Rural water supply project in Eastern region (UNDP/Dutch)	217	30	315	120	555	73		79	1,087	302
8. Rural water supply project (Western state) (Rumania)		30	740	80	1,123	86	5,828	1,283	7,691	1,479
9. Building rural water supply division				103		42		59		204
Total	3,297	160	4,173	1,103	6,533	907	12,091	5,893	26,094	8,063

On the other hand, the details of the budget requested from CWSD to the Ministry of Finance and Economic Planning according to the Three-Year Plan from 1995 to 1997 prepared by the CWSD is shown in Table 2-11. From the table, the expenditures for civil engineering amount to 48%, which clearly is larger than other expenditures. Compared with the civil engineering expenses, the salary for staff accounts for only 4%.

Table 2-11 Budget requested for CWSD (in 100 million cedis)

	1995		1996		1997	
	Amount of budget	Ratio(%)	Amount of budget	Ratio(%)	Amount of budget	Ratio(%)
Salary for staffs	8.01	4%	9.61	4%	12.01	4%
Operating funds	8.27	4%	9.91	4%	12.38	4%
Expenses for civil engineering	92.77	48%	117.32	47%	146.65	48%
Consultants fee	54.43	27%	65.31	26%	81.63	27%
Procurement costs of equipment	35.52	17%	46.26	19%	53.27	17%
Total	204.00	100%	248.41	100%	305.94	100%

Taking into consideration the above-mentioned budget situation, the project expenses that the Government of Ghana can appropriate for this project are the following:

Personnel expenses : ¥ 9,600,000 (equivalent to 5% of 800 million cedis as the salary for all staff of CWSD in 1995)

Office rental fee : ¥ 10,800,000 (equivalent to the three years' rental fee based on the rent of 0.3 million yen per month

Telephone and fuel costs : ¥ 1,000,000

Construction of 450 boreholes : ¥ 9,000,000 (based on 20,000 Yen per borehole investment by the communities)

Total : ¥ 30,040,000

Approx. : ¥ 30,000,000

2-4-3 Personnel

GWSC, the executing agency of this project, appoints the Deputy Managing Director of CWSD as Project Director and three professional and five drilling staff to the project.

Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Concept

An effective and economical implementation plan must be developed to achieve the objectives of this project.

(1) Basic matters

The professional staff of both Japan and Ghana must be effectively assigned to the work and their area of responsibility must be clearly demarcated to achieve the objectives of the project through mutual cooperation.

Working groups consisting of the required number of staff must be organized to reduce the loss of time.

Community education activities and borehole site selection must be started as early as possible.

A borehole construction schedule, effectively using the dry season period, must be developed.

An implementation plan taking into consideration the labor laws, local customs, and the natural conditions of Ghana must be prepared.

(2) Areas in which the local contractors will be used

The local consultants must be assigned to the community education activities and engaged as the subcontractors to the Japanese consultant. The CWSD will be in charge of the management and supervision of the community education activities.

The local drilling contractors will be used as the subcontractors of the Japanese contractor. Supervision of borehole drilling and pumping tests will be done by a Japanese consultant and /or the CWSD personnel.

(3) Necessity for dispatching the engineers from Japan

Rehabilitation of drilling rigs will be conducted by D/U under the guidance and supervision of engineers dispatched from the drilling rig manufacturer in Japan. For this purpose, two mechanical engineers must be dispatched for a short period of two months. In order to provide technical instruction to the staff of D/U, it is necessary to dispatch two drilling engineers for 12.5 months.

(4) Implementation system of Ghana

The management structure is shown in Fig 1-3 and the responsibility for each implementation stage will be as follows.

Project manager from CWSD has overall responsibility for execution of the project.
Effective management of equipment to be procured under the project will be the responsibility of the accountant and procurement officer of CWSD.
The supervision and the flow control of the borehole construction work will be done by the project manager of CWSD with assistance from Japanese consultant.

3-1-2 Implementation Conditions

(1) Because the objective of this project is to construct water supply facilities for communities, the borehole construction site must be selected within the community or exceptional case radius within 500 m of that community. The selection considering the above-mentioned restriction needs to use the engineers with sufficient experience who can correctly ascertain the hydro-geological conditions and therefore can determine the site properly.

(2) In conducting the community education activities, conversation with community residents is very important. It is therefore recommended to use local consultants who have staff who are well versed in the local language and the customary practices.

3-1-3 Scope of work

The implementation approach of this project will be organizing a team for each of seven types of work including administrative work. The scope of work of each team is as follows. Leveling of ground and repair of access roads must be conducted by the community.

(1) CWSD and consultants

Borehole site selection (community education activities and geophysical exploration) : Consultant/Local Consultant

Supervision of community education activities : CWSD

Liaison and coordination with central and local administrative agencies : CWSD/Consultant

Supervision of work and work schedules : CWSD/Consultant

Arrangement and analysis of work progress and supervision of the work progress : Consultant / CWSD

Acceptance inspection of the procured equipment and the completed facilities : CWSD/Consultant

(2) Work management team

Management and coordination of borehole construction works : Japanese contractor
Labor management of workers : Japanese contractor
Procurement and provision of equipment : Japanese contractor
Operation and management of construction office and camp : Japanese contractor
Preparation and submission of work records : Japanese contractor

(3) Equipment maintenance team

Management of drilling equipment : Japanese contractor
Regular inspection and repair of drilling equipment : Japanese contractor

(4) Borehole construction team

Preparation of borehole construction : Japanese contractor/Local contractor
Mobilization of drilling rigs and equipment : Japanese contractor/Local contractor
Borehole construction : Japanese contractor/Local contractor
Electrical well logging : Japanese contractor/Local contractor
Finishing work of boreholes : Japanese contractor/Local contractor

(5) Borehole testing team

Implementation and analysis of borehole tests
: Japanese contractor/Local contractor
Implementation and analysis of water examination
: Japanese contractor/Local contractor
Determination of pump depth : Japanese contractor

(6) Civil engineering work team

Concrete works : Japanese contractor/Local contractor
Pump installation : Japanese contractor/Local contractor

3-1-4 Consultant supervision

In this project, the consultant recommended by JICA will conduct the following design and supervision in accordance with the agreement between the Governments of Ghana and Japan.

(1) Design supervision

- Detail design for procurement of equipment, implementation of construction work and preparation of tender documents for this project.

- Analysis and evaluation of tender documents on behalf of GWSC.
- Witnessing and advising on the contract negotiation between the selected contractor and GWSC.
- Supervision of procurement of equipment.
- Other Consultant work.

(2) Construction supervision

Throughout the construction period, the consultant will have responsibility of conduct the following works.

- Liaison and management with related agencies of Ghana
- Confirmation of communities included in the project
- Work on site for borehole site selection
- Approval of construction records submitted by a contractor
- Flow control
- Inspection of procured equipment and completed facilities

3-1-5 Procurement Plan

Among the equipment necessary for the borehole construction, hand pumps, compressors, and light vehicles will be procured in Ghana for reasons earlier stated. The spare parts to be used for the overhaul of the drilling rigs, drilling tools and equipment to be used for community education activities will be procured in Japan.

All equipment to be procured in Japan will be shipped to Tema harbor in Ghana after which the equipment and spare parts for drilling rigs will be transported by road to D/U in Kumasi. Equipment for community education activities and operation and maintenance of boreholes will be delivered to the CWSD headquarters in Accra.

3-1-6 Implementation Schedule

(1) Responsibilities of Japanese and Ghanaian Sides

The responsibilities of both Japanese and Ghanaian Sides are listed in Table 3-1 below.

Table 3-1 Responsibilities to be Borne by Japanese and Ghanaian Sides

Responsibilities to be borne by Japanese Side	Responsibilities to be Borne by Ghanaian Side
1 Implementation design.	1 Provision of reference materials and information necessary for design work.
2 Procurement, transportation and delivery of planned equipment.	2 Provision and coordination of land at borehole sites and preparation of access
3 Implementation of borehole site selection.	3 Supervision of community education activities.
4 Construction of 450 boreholes with hand pumps	4 Construction of drain pits which are additional facilities at each borehole.
5 Overhauling of two sets of existing drilling rigs.	5 Provision of project office and provision of expenses for furniture, electricity, water, and local communication.
6 Dispatch of construction supervising engineers and provision of supervision	6 Provision of project staff and their salaries.
7 Transfer of technology.	7 Tax exemption measures for the equipment to be procured.

(2) Implementation period for each Stage

The implementation period for Stages I and II by Japanese Side is shown in Table 3-2 below.

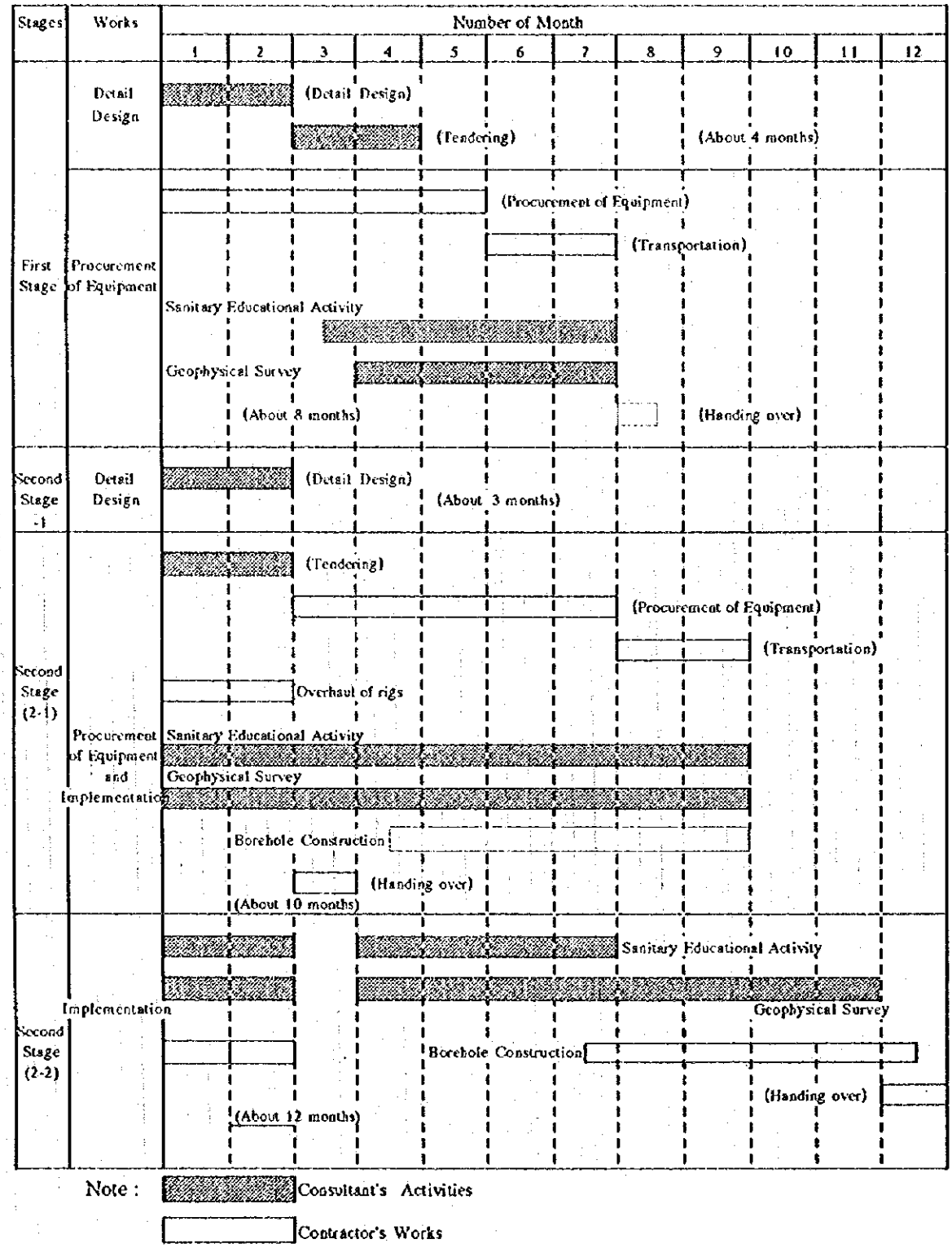
Table 3-2 Implementation Period of stages I and II (Japanese Side)

Activity	Number planned	Required No. of days/unit	No. of teams	Required No. of Months	Stage I	Stage II
Implementation design	1 set	-	1	8	4	4
Procurement and transferal of equipment	1 set	-	1	14	7	7
Overhauling of drilling rigs	2 sets	-	1	2	0	2
Borehole site selection (community education activities)	295 communities	5.0	3	19.5	4.5	15
Borehole site selection (geophysical survey exploration)	450 points	2.6	2	23.5	4	19.5
Borehole construction	450 boreholes	-	6	12.5	0	12.5

The borehole construction work cannot be continued during the rainy season. However, the borehole site selection can be conducted throughout the year except during the peak of the rainy season between usually July and May.

The implementation schedule (chart) of the project is shown in Figure 6.

Figure 3-1 Implementation Schedule



3-1-7 Obligations of the Government of Ghana

The undertakings of the Government of Ghana for the project are as follows:

(1) To make available the land for drilling sites.

(2) To ensure that access roads are in good condition and to construct access roads when necessary.

(3) To provide D/U personnel to repair the drilling rigs.

(4) To provide tax exemption for the equipment to be procured.

(5) To provide tax relief to all Japanese staff engaged in the implementation of this project during their stay in Ghana.

(6) To facilitate the necessary measures for the embarkation and disembarkation and the stay of the Japanese people related to the implementation of this project

(7) To ensure effective maintenance of the borehole facilities and equipment to be delivered in this project.

(8) The delivered equipment must be used strictly for the community water supply project.

(9) After the Exchange of Notes, the Government of Ghana shall open an account with an authorized foreign exchange bank of Japan and issue Authorization to Pay as and when necessary to ensure the smooth implementation of the project.

(10) To establish project offices in Accra and Koforidua.

(11) To assign personnel from the CWSD and D/U to this project and to pay their salaries.

(12) To bear the local communication expenses of the project

3-2 Project Cost Estimation

The allocation of expenses of both Japanese and Ghanaian Sides is shown in the table below.

Project expenses to be borne by the Japanese Side	Project expenses to be borne by Ghanaian Side
1. Implementation and design expenses	1. Securing of borehole sites and expenses for leveling of grounds
2. Procurement and transportation expenses of procured equipment	2. Preparation cost for access roads
3. Expenses for borehole site selection (community education activities and geophysical exploration)	3. Construction cost for soak-away which are the additional facilities of boreholes
4. Construction cost of 450 boreholes with handpumps	4. Expenses to establish and maintain the project office
5. Expenses to overhaul two sets of existing drilling rigs	5. Salaries for GWSC personnel of the project
6. Expenses to dispatch construction supervising engineers and the construction management services	6. Expenses obtaining tax exemption for the equipment to be procured

1. Expenses for securing the borehole site and leveling of ground
   : 5,000 cedis/person x 10 people x 2 days x 30 communities = 3,000,000 cedis

2. Expenses for preparing the access roads:
   5,000 cedis/person x 10 people x 2 days x 30 communities = 4,500,000 cedis

3. Construction cost of drainage pits as the additional facilities of boreholes
   : 5,000 cedis/person x 10 people x 1 day x450 boreholes = 22,500,000 cedis

4. Expenses for establishing and maintaining the project office
   : 250,000 cedis/month x 12 months x 3 years = 32,400,000 cedis

5. Expenses for the supervising personnel of the project : 121,908,000 cedis
   Project Manager : 588,000 x 36 months = 21,168,000 cedis
   Engineers : 420,000 x 72 months = 30,240,000 cedis
   Technicians : 378,000 x 62.5 months = 23,625,000 cedis
   Allowance for technicians : 750,000 x 62.5 months = 46,875,000 cedis

6. Expenses for the procedure for tax exemption measures for the equipment to be procured
   : 500,000 cedis / lot

3-3 Maintenance and Management Plan

The organization shown in Figure 3-2 will be responsible for the operation and maintenance of community water supply facilities. Levy and expenses of a water point committee will be estimated as follows;

Levy and fund

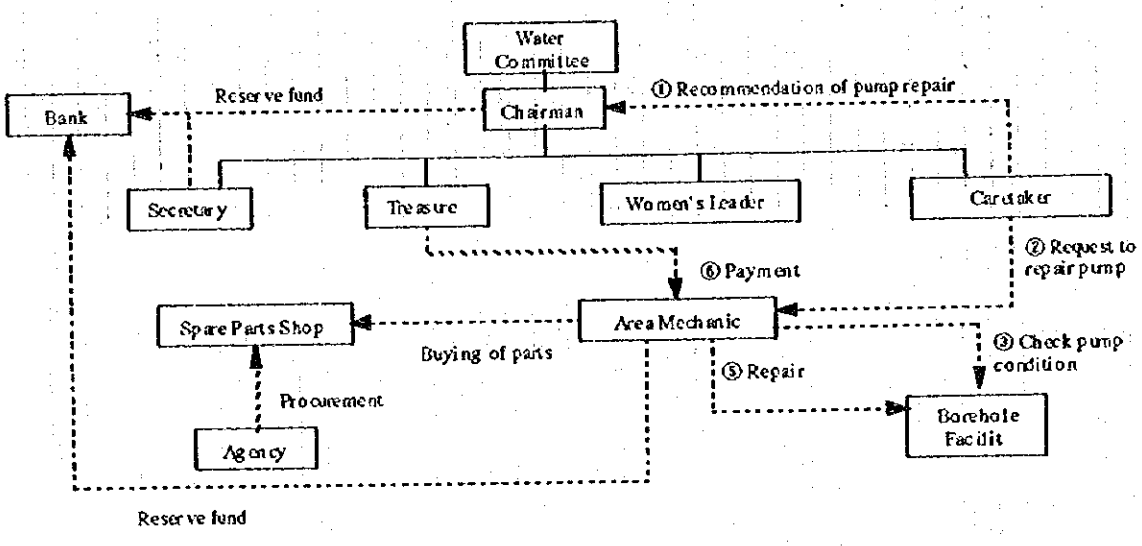
1. Water levy	: 90,000 cedis / year (25 cedis / capita / month)
2. Fund at borehole construction	: 250,000 cedis
Total	: 340,000 cedis

Expenses

1. Repair fee	: 50,000 cedis / year
2. Spare parts	: 25,000 cedis / year
Total	: 75,000 cedis / year

The maintenance and management cost in a year can be covered by this levy and the fund will be used when a further rehabilitation is necessary in future. The life of a handpump will be estimated within approximately 10 years in the case of the aforementioned maintenance.

Figure 3-2 Management and Maintenance Organization



Chapter 4 Project Evaluation and Recommendation

4-1 Project Effect

(1) Present conditions

(a) GWSD has scheduled 1220 boreholes to be constructed in Greater Accra and Eastern Regions under the Operation Sparkling Groundwater Plan (6,000 borehole construction plan). So far constructed boreholes number only 324 as of 1993, which is equivalent to 26 % of 1220 boreholes scheduled under the plan. This present condition shows that a rural water supply is not yet developed in Ghana.

(b) Water-borne diseases occur in the project area due to lack of a concept of sanitation regarding drinking water that the WHO and other organizations recommended. It is one of the important aspects of how to improve the concept of sanitation by implementing this project.

(c) Before execution of the Community Demand-Driven Approach, the maintenance and management of water supply facilities did not function well due to a shortage of finances and incompleteness of management organization.

(d) Even if the construction of 1029 boreholes is computed the water supply faciliities will still not be able to cope with the high population growth (2.6%).

(2) Project Effect

(a) After completion of 450 boreholes in the beneficial area of the Regions, the community water coverage will be increased with 11 % (from 51 % to 62 %) in the Greater Accra Region and with 15 % (from 29 % to 44 %) in the Eastern Region.

(b) Potable water of 20 liters / day / capita will be assured throughout the year for the population of 135,000 at least in the target area of the two Regions.

(c) And then, the population of 135,000 will be safe from such water-borne diseases as Guinea Worm disease.

(d) The concept of community hygiene will be rapidly improved by the education activities in the target area.

(e) The sanitation concept will be rapidly improved by the community educational activities. Governmental reinvestment costs for management will be considerably reduced by using the organization of water point committees.

(f) After completion of this project, the drilling equipment and other materials with spare parts will be beneficial to the GWSC, which may used them for emergency borehole construction, small fund projects etc.

4-2 Recommendations

The community educational activities should be implemented through assistance of GWSC at both regional and district levels. GWSC should, therefore, ensure personnel and the expenses necessary for such activities.

After completion of the project, monitoring and technical assistance to the committee have to be continuously provided by DWST under the management of GWSC, which would make the project effective.

CWSD should consider future programmes for application of both the education equipment and its experiences through the implementation of the project.

Drilling Unit (D/U) will be able to construct boreholes without technical assistance, because the D/U staff learns drilling techniques and site management through on-the-job training in the project. CWSD has expressed a wish that two sets of drilling rigs repaired in the project should be used by D/U for borehole construction in the case of attending emergency situations and small fund projects. However, there is a few project for borehole construction funded by Ghana Government so that D/U is forced to contract a private sector's project for management of its organization. CWSD should, therefore, schedule future applications for D/U and the rigs.

CONTENTS
OF
APPENDICES

Appendices-1 Member List of the Survey Team

(1) Basic Design Team

Leader	
Mr. Hidetomi OI	Institute for International Cooperation, JICA
Project Coordinator	
Mr. Yujiro YABE	Grant Aid Division, Economic Cooperation Bureau, Ministry of Foreign Affairs
Planning and Management	
Eita NARITA	First Basic Design Study Division, Grant Aid Study and Design Department, JICA
Project Manager	
Mr. Iwao HAMADA	Sanyu Consultants Inc.
Hydrogeologist	
Mr. Koumei OZAKI	Sanyu Consultants Inc.
Geophysicist (I)	
Makoto UOTANI	Sanyu Consultants Inc.
Geophysicist (II)	
Yasuhiro NAKAMURA	Sanyu Consultants Inc.
Equipment Planner	
Fujio MATSUMOTO	Sanyu Consultants Inc.

(2) Team for Explanation of Draft Report

Leader	
Mr. Hidetomi OI	Institute for International Cooperation, JICA
Planning and Management	
Eita NARITA	First Basic Design Study Division, Grant Aid Study and Design Department, JICA
Project Manager	
Mr. Iwao HAMADA	Sanyu Consultants Inc.
Hydrogeologist	
Mr. Koumei OZAKI	Sanyu Consultants Inc.
Equipment Planner	
Fujio MATSUMOTO	Sanyu Consultants Inc.

2. Survey Schedule

Basic Design Study

No.	Date	Day	Activities	Stay
1	Oct. 21	Sat.	A-G : Left Tokyo	Amsterdam
2	22	Sun.	A-G : Arrived in Accra	Accra
3	23	Mon.	A-G : Courtesy call on Embassy of Japan,JICA Office,Ministry of Finance & Economic Planning and Ministry of Works & Housing	Accra
4	24	Tue.	A-G : Discussion on Inception Report with GWSC	Accra
5	25	Wed.	A-G : Discussion on Inception Report with GWSC,reconnaissance survey	Accra
6	26	Thu.	A-G : Reconnaissance survey for D/U in Kumasi	Accra
7	27	Fri.	A-G : Discussion on Minutes	Accra
8	28	Sat.	A-G : Data collection	Accra
9	29	Sun.	A-G : Data collection	Accra
10	30	Mon.	A-G : Exchanged the Minutes of Discussions	Accra
11	31	Tue.	A-G : Courtesy call on Embassy and JICA Office,Team Leader left for Japan	Accra
12	Nov. 1	Wed.	A-C : Arrived in London	London
			D-G : Data collection	Accra
13	2	Thu.	A-C : Left London for Tokyo	in Air
			D-G : Data collection	Accra
14	3	Fri.	A-C : Arrived in Tokyo	
			D-G : Data collection and preparation works for GEP	Accra
15	4	Sat.	D-G : Data collection and preparation works for GEP	Accra
16	5	Sun.	D-G : Inner meeting	Accra
17	6	Mon.	D-G : Field survey for Eastern Region	Koforidua
18	7	Tue.	D-G : Field survey for Eastern Region	Koforidua
19	8	Wed.	D-G : Field survey for Eastern Region	Koforidua
20	9	Thu.	D-G : Field survey for Eastern Region	Koforidua
21	10	Fri.	D-G : Field survey for Eastern Region	Koforidua
22	11	Sat.	D-G : Field survey for Eastern Region	Koforidua
23	12	Sun.	D-G : Inner meeting	Accra
24	13	Mon.	D-G : Field survey for Eastern Region	Koforidua
25	14	Tue.	D-G : Field survey for Eastern Region	Koforidua
26	15	Wed.	D-G : Field survey for Eastern Region	Koforidua
			H : Left Tokyo	London
27	16	Thu.	D-G : Field survey for Eastern Region	Koforidua
			H : Arrived in Accra	Accra
28	17	Fri.	E-G : Field survey for Eastern Region	Koforidua
			D,H : Courtesy call on Embassy and JICA Office and GWSC	Accra
29	18	Sat.	E-G : Field survey for Eastern Region	Koforidua
			D,H : Inspection of equipment	Accra
30	19	Sun.	E-G : Data arrangement	Koforidua
			D,H : Data arrangement	Accra

Note: A:Team Leader, B:Project Planner, C:Project Coordinator
D:Chief Engineer, E:Hydrogeologist F,G: Geophysician
H:Equipment Planner

No.	Date	Day	Activities	Stay
31	20	Mon.	E-G : Field survey for Eastern Region	Koforidua
			D,H : Inspection of drilling rig	Kumasi
32	21	Tue.	D-G : Field survey for Eastern Region	Koforidua
			H : Inspection of drilling rig	Kumasi
33	22	Wed.	D-G : Field survey for Eastern Region	Koforidua
			H : Inspection of equipment	Kumasi
34	23	Thu.	D-G : Field survey for Eastern Region	Koforidua
			H : Inspection of drilling rig	Wa
35	24	Fri.	D-G : Field survey for Eastern Region	Koforidua
			H : Inspection of drilling rig	Wa
36	25	Sat.	D-G : Field survey for Eastern Region	Koforidua
			H : Inspection of drilling rig	Kumasi
37	26	Sun.	D-G : Data arrangement	Accra
			H : Data arrangement	Kumasi
38	27	Mon.	D-G : Field survey for Greater Accra Region	Accra
			H : Inspection of drilling rig	Nkwanta
39	28	Tue.	D-G : Field survey for Greater Accra Region	Accra
			H : Inspection of drilling rig	Ayase
40	29	Wed.	D-G : Field survey for Greater Accra Region	Accra
			H : Inspection of drilling rig	Busua
41	30	Thu.	D-G : Field survey for Greater Accra Region	Accra
			H : Inspection of drilling rig	Kumasi
42	Dec. 1	Fri.	D-G : Field survey for Greater Accra Region	Accra
			H : Inspection of equipment	Kumasi
43	2	Sat.	D-G : Field survey for Greater Accra Region	Accra
			H : Inspection of equipment	Kumasi
44	3	Sun.	D-G : Data arrangement	Accra
			H : Data arrangement	Kumasi
45	4	Mon.	D-H : Field survey for Greater Accra Region	Accra
46	5	Tue.	D-H : Field survey for Greater Accra Region and data collection	Accra
47	6	Wed.	D-H : Field survey for Greater Accra Region and data collection	Accra
48	7	Thu.	D-H : Field survey for Greater Accra Region and data collection	Accra
49	8	Fri.	D-H : Field survey for Greater Accra Region and data collection	Accra
50	9	Sat.	D-H : Field survey for Greater Accra Region and data collection	Accra
51	10	Sun.	D-H : Inner meeting	Accra
52	11	Mon.	D-H : Review of collected data and meeting with CWSD	Accra
53	12	Tue.	D-H : Meeting with CWSD	Accra
54	13	Wed.	D-H : Supplemental data collection	Accra
55	14	Thu.	D-H : Supplemental data collection	Accra
56	15	Fri.	D-H : Courtesy call on Embassy and JICA Office	Accra
57	16	Sat.	D-H : Left Accra	in Air
58	17	Sun.	D-H : Arrived in London	London
59	18	Mon.	D-H : Left London for Tokyo	in Air
60	19	Tue.	D-H : Arrived in Tokyo	

Explanation of draft report

No.	Date	Day	Activities	Stay
1	Feb. 14	Wed.	A-E : Left Tokyo	London
2	15	Thu.	A-E : Arrived in Accra	Accra
3	16	Fri.	A-E : Courtesy call on Embassy and JICA Office and GWSC	Accra
4	17	Sat.	A-E : Inner meeting	Accra
5	18	Sun.	A-E : Inner meeting	Accra
6	19	Mon.	A-E : Courtesy call on Ministry of Finance & Economic Planning and Ministry of Works & Housing,discussion on Minutes	Accra
7	20	Tue.	A-E : Discussion on Minutes	Accra
8	21	Wed.	A-E : Discussion on Minutes	Accra
9	22	Thu.	A-E : Signning of the Minutes of Discussions	Accra
10	23	Fri.	A-E : Left Accra	in Air
11	24	Sat.	A-E : Left London	in Air
12	25	Sun.	A-E : Arrived in Tokyo	

Note: A:Team Leader, B:Project Coordinator
C:Chief Engineer, D:Hydrogeologist
E:Equipment Planner

Appendix-3 List of Party Concerned in the Recipient Country

1.Government of Ghana

Mr. E. K. Fosu	Minister, International Economic Relations Division, Ministry of Finance & Economic Planning
Dr. William Adote	Director International Economic Relations Division Ministry of Finance & Economic Planning
Mrs. Agnes Batsa	Head of Bilaterals Ministry of Finance & Economic Planning
Mr. Kwasi Opoku	Economic Planning Officer and Officer in charge of Japan's Desk Ministry of Finance & Economic Planning
Mr. Edmund Nkansah	Economic Planning Officer Ministry of Finance & Economic Planning
Mr. E. D. Nanor	Deputy Minister Ministry of Works & Housing
Mr. G. Nai	Director Ministry of Works & Housing
Mr. E. K. Y. Dovlo	Managing Director, Ghana Water & Sewerage Corporation
Mr. Osei Poku	Ag. Managing Director, Ghana Water & Sewerage Corporation
Mr. P. O. Sackey	Ag. Deputy managing Director Community Water & Sanitation Division
Mr. R. K.D. Van-ess	Technical Coordinator Community Water & Sanitation Division
Mr. E. F. Boateng	Regional Coordinator Community Water & Sanitation Division
Mr. M. O. Dawson-Annan	Zonal Hydrogiologist Community Water & Sanitation Division
Mr. Maxwell Addo	Accountant / Procurement Officer Community Water & Sanitation Division
Mr. S. E. Asiman	Zonal Planner Community Water & Sanitation Division

Mr. Thomas M. K. Osey	Principal Hydrogeologist
	Ag. Drilling Engineer, Drilling Unit
Mr. Isaac Y. Asamoah	Chief Driller
	Drilling Unit
Mr. Ofori Sampong	Workshop Manager, Drilling Unit
Mr. Raphael Gafifie	Unit Administration Officer
	Drilling Unit
Mr. A. Y. Trimpong	Hydrogeologist
	Drilling Unit
Dr. S. Dapaah-Siakwan	Groundwater Division
	Water Resources Research Institute
Mr. E. A. Barns	Water Quality Division
	Water Resources Research Institute
Mr. D. C. Frempons	Hydrogiologist
	Water Resources Research Institute
Mr. Anthony A. Duah	Hydrogiologist / Geophysicist
	Water Resources Research Institute

2. Foreign Organizations

Mr. Jagdish Bahal	Senior Urban Finance Specialist
	Infrastructure Division, The World Bank
	Resident Mission in Ghana
Mr. Godfrey Ewool	Project Officer, The World Bank
	Resident Mission in Ghana
Mr. Mike Wood	First Secretary (AID)
	British High Commission
Mr. Chandran Tai	Project Officer
	CIDA
Mr. Jean-Claude Andreni	Deputy Managing Director
	BURGEAP, France
Mr. Christphe Prevost	Socio-Economist, BURGEAP, France
Mr. Thierry Barbotte	BURGEAP, France

Appendix-4 Minutes of Discussions

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY
ON
THE PROJECT FOR RURAL WATER SUPPLY PHASE III
IN
THE REPUBLIC OF GHANA

Based on the results of the Preliminary Study, the Japan International Cooperation Agency (hereinafter referred to as " JICA ") decided to conduct a Basic Design Study on the Project for Rural Water Supply Phase III (hereinafter referred to as "the Project ").

JICA has sent a Basic Design Study Team (hereinafter referred to as "the Team ") to the Republic of Ghana, which is headed by Mr. Hidetomi OI, Development Specialist, JICA, and is scheduled to stay in the Republic of Ghana from October 22 to December 15, 1995. The Team has held discussions with the officials concerned of the Government of the Republic of Ghana (G.O.G.) and conducted a field survey of the study area.

In the course of the discussions and field survey, both parties have confirmed the main items described in the attached sheet. The Team will proceed with further works and prepare the Basic Design Study Report.

Accra, 30 October 1995

Mr. Hidetomi OI
Leader,
Basic Design Study Team,
JICA

Dr. William ADOTE
Director,
International Economic Relations Division,
Ministry of Finance

Mr. E. D. NANOR
Deputy Minister,
Ministry of Works and Housing

Mr. P. O. SACKEY
for Managing Director,
Ghana Water and Sewerage Corporation

Attached sheet

1. Objective of the Project

The objective of the Project is to provide potable water in rural communities by constructing boreholes to improve the health standard of people living in these areas.

2. Project Sites

The project sites are located in the communities of ten Districts in Eastern and Greater Accra Regions as shown in Annex 1-1.

The final project sites will be determined subject to the result of further study by the Team and also the outcome of community education to be made in advance of construction of boreholes. Accordingly all the communities in Annex 1-2 are not necessarily covered by the Project.

3. Executing Agency

The Ghana Water and Sewerage Corporation (G.W.S.C.) of the Ministry of Works and Housing through its Community Water and Sanitation Division (C.W.S.D.) is responsible for the administration and execution of the Project. The organization chart is attached in Annex 2.

4. Items Requested by G.O.G.

After discussions with the Team, G.O.G finally requested the following items:

1) Construction of about four hundred and fifty (450) successful boreholes with handpumps in the project sites,
2) Procurement of materials, equipment and spare parts for the construction of boreholes with handpumps,
3) Procurement of equipment for community education and technical support for operation and maintenance of boreholes with handpumps. Details are listed in Annex 3,
4) Overhaul of existing drilling units, and
5) Procurement of services for the implementation of the Project including those required for community education.

5. Japan's Grant Aid System

G.O.G. has understood Japan's Grant Aid System, especially the necessary measures to be taken by G.O.G., as explained by the Team. Details of the system are attached in Annex 4.

6. Schedule of the Study

1) The Team will proceed with further studies in the Republic of Ghana until December 15, 1995.
2) JICA will prepare the draft report of the Project in English and dispatch a mission to the Republic of Ghana in order to explain its contents in February 1996.
3) In case that the contents of the draft report is accepted in principle by G.O.G., JICA will complete the final report and send it to G.O.G. by April 1996.

7. Community Demand Driven Approach

1) G.O.G. shall establish a water point committee (including fund) as a precondition for construction of boreholes with handpumps in each community.
2) G.O.G. shall establish new maintenance system by setting up area-mechanics for repair of handpumps and spare-parts shops to cover the project sites.

8. Participation of Private Firms in Construction of Boreholes

G.O.G. has understood that either of the following two alternatives for construction of boreholes with handpumps will be applied:

1) Construction of boreholes by private firms only,
2) Construction of boreholes by both the Drilling Unit and private firms.

Annex 1-1 Location Map of Project Site.

Annex 1-2 List of Communities

REGION; GREATER ACCRA
DISTRICT; GA

No.	Communities	No.	Communities	No.	Communities
1	Manchi	12	Sansanodumase	23	Asimaha
2	Manhean	13	Teiman	24	Ayimensah
3	Musuko	14	Adenklebi	25	Dedeiman
4	Nsakina	15	Afuaman	26	Degbedzikope
5	Odumase	16	Akotoshie No.1	27	Damesampaman
6	Okushiebiadey	17	Akotoshie No.2	28	Fankmayera
7	Onyansana	18	Akporman	29	Kofidonkor
8	Osorodonpe	19	Akwakyiri No.1	30	Konkon No.1
9	Paanor	20	Akwakyiri No.2	31	Kordeyman
10	Papase	21	Amomole	32	Kuiyi
11	Sansancana	22	Ardzyman	33	Kyeleyewore

REGION; GREATER ACCRA
DISTRICT; DANGBE WEST

No.	Communities	No.	Communities	No.	Communities
1	Abuviekpog	5	Lawer Kope	8	Tokpo
2	Asebi	6	Luomshai	9	Tsumkpo
3	Forkpe	7	Odumse	10	Volivo Gbesedom
4	Lakpleka				

REGION; EASTERN
DISTRICT; ASUOGYAMAN

No.	Communities	No.	Communities	No.	Communities
1	Dawatokro No.2	11	Yaniama	21	Ghanakpe
2	Dodi Asantekrom	12	Abodom	22	Manyayoyim
3	Dzidzorkope	13	Addokrom	23	Marine Medekpo
4	Gyakiti	14	Adugyan	24	Marine Nyameben
5	Kurankyi	15	Adrobensu-Nkwateng	25	Mpakadan Old Town
6	Kwanyako	16	Akyekrom	26	Netikope
7	Mangoase	17	Amenam	27	Old Akrade
8	Pokuase	18	Asuoabena	28	Survey Line
9	Sapor	19	Betenase	29	Abokyikrom
10	Tortibo Konopiem	20	Kontanase	30	Akro funso

REGION; EASTERN
DISTRICT; WEST AKIM

No.	Communities
1	Aworasa
2	Breku Nyadeya
3	Bunso
4	Esaase
5	Kobriso
6	Kofi Ansah
7	Kofi Kyere
8	Krodua No.1
9	Krodua No.2
10	Kumikrom
11	Kwaku Sae
12	Kwaobaa
13	Kyirikoase No.1
14	Kyirikoase No.2
15	Lartey
16	Nkuraakan
17	Nyankumase Town
18	Nyauoa
19	Obeng Yaw
20	Obonema
21	Obuotwene
22	Okurase
23	Sukrong Budu
24	Takorase
25	Tutu Akantens
26	Tweapease
27	Aboa Osudoninya
28	Aboabo
29	Dwuafoakwa
30	Kofi Asare

REGION; EASTERN
DISTRICT; YILO KROBO

No.	Communities
1	Agordjor
2	Aketebour
3	Akormu-Bana
4	Akpo Sratoku
5	Akpo-Bunase
6	Ameganya
7	Djoplenya
8	Esuom
9	Kakama-Bunase
10	Klo-Odjobi
11	Korm-Touse
12	Korm-Tseredom
13	Kponokle-Pahionya
14	Labalabo
15	Nsutapon-Bonya
16	Nsutapon-Tepuornya
17	Nsutapong
18	Odugblase
19	Omlase
20	Onumaku
21	Porpose
22	Salom
23	Sutawar
24	Sutri-Sokwenyatri
25	Tsepease
26	Tsremateng Dongwanor
27	Wawase
28	Sokwenya
29	Takunya
30	Ahieyom
31	Koryire

40.

REGION; EASTERN
DISTRICT; MANYA KROBO

No.	Communities
1	Ahinkwawa Korn
2	Akatebourdorm
3	Akelebourtorm
4	Aketebour Wanya
5	Ako Blonya
6	Akotue Blorso
7	Akumersu Sisi
8	Akutue Sler
9	Anyasu Kenya
10	Apana Dorm
11	Apimsu-Wayo
12	Apotroko
13	Awawaso Abude
14	Awawaso Agormania
15	Awawaso Akwenor
16	Awawaso Gmerle
17	Aworhlorso Kpeti
18	Aworworso Sisi
19	Aworworsu Kpeti
20	Ayemesu Sisi
21	Ayemesu Mapi
22	Bedzua
23	Baepong Manya
24	Bormase Huenya
25	Bormase Sublenor
26	Brepaw Akuenor
27	Bupaw Sisi
28	Brepaw Titi
29	Bukunor-Kpose
30	Dahome
31	Dawa Ama Krom
32	Dawa Abrodem
33	Dada Aportor
34	Dawa Yokunor
35	Djaman
36	Dzoplenya
37	Elamase
38	Fantem Ponponya
39	Kaditre Dawa
40	Klum Dorse
41	Klumanya
42	Kobase
43	Kodiabe
44	Konor Dawa
45	Kordum
46	Korhum
47	Kuaweresisi
48	Kwabia Mampong
49	Kwabia-Sokuenya
50	Kwaopeniase-Yidorm
51	Megadu
52	Mtewa Dounya
53	Nafikope
54	Narten Dogbagzi
55	Obdokwenya
56	Obisua
57	Oborkesem
58	Oborpa Sisi
59	Obosi
60	Obrahohor
61	Oburpa Dorse
62	Odichirase
63	Odichirase Abor-Chrase
64	Ohiada
65	Okpesi
66	Ollortorm
67	Oyaganta
68	Patcailonya
69	Popotia
70	Samuah
71	Sapor
72	Sekesua-Wayo
73	Seseamang Yiti
74	Srem Abesre Yiti
75	Suduasa
76	Suduase
77	Sutapong Terpuonya
78	Takorase Miom
79	Takumta
80	Ynakorpe
81	Yokpem
82	Akyikyiso
83	Anokye
84	Asubour
85	Asuogya
86	Otokpolu
87	Otokpolu
88	Sempoamiensa
89	Sokode Juaso
90	Tibaso
91	Worapon
92	Adibensu
93	Amlakpo Adebensu
94	Amponsan Dene
95	Anfaso
96	Anom
97	Asotowa
98	Asuboi-Zongo
99	Abisiim No.2
100	Obisua

REGION; EASTERN
DISTRICT; EAST AKIM

No.	Communities	No.	Communities	No.	Communities
1	Brepro	13	Pertetifi	25	Akumasu
2	Ehiawoawu No.1	14	Samlesi	26	Akwamu-Kotoku
3	Ettukrom	15	Samlesi-Amega	27	Akwansram
4	Kpando (Kplandey)	16	Swubriso Camp	28	Apesika
5	Kwasi Komfo	17	Wurapom	29	Asedja
6	Mpayem	18	Abetemso	30	Famponso
7	Nobi	19	Adjeikrom	31	Orgorme
8	Nsuta	20	Agyamasu	32	Subviso
9	Obodanase	21	Ahumahumasu	33	Abodobi
10	Owura Twum	22	Akontaa No.2	34	Biremso
1	Pano	23	Akoradako	35	Ekorso Wekpetim
12	Papa Tetteh Village	24	Akuase		

REGION; EASTERN
DISTRICT; KWAEBIBREM

1	Merenponso	11	Aseseeso	21	Atawase
2	Mpeasem	12	Asi Kam No. 2	22	Atobiase No.1
3	Okyinso	13	Asona	23	Atobiase No.2
4	Tetekasom	14	Asuobone	24	Awisesu Amlam
5	Abepotia	15	Ataaso	25	Banka
6	Abisu No.1	16	Atawase	26	Battorkope
7	Addaiso	17	Asona	27	Bedowso
8	Ampekrom	18	Asubone No.3	28	Boadikrom
9	Aprakwem	19	Asubone	29	Brafoa
10	Asantekrom	20	Ataaso	30	Brebesua

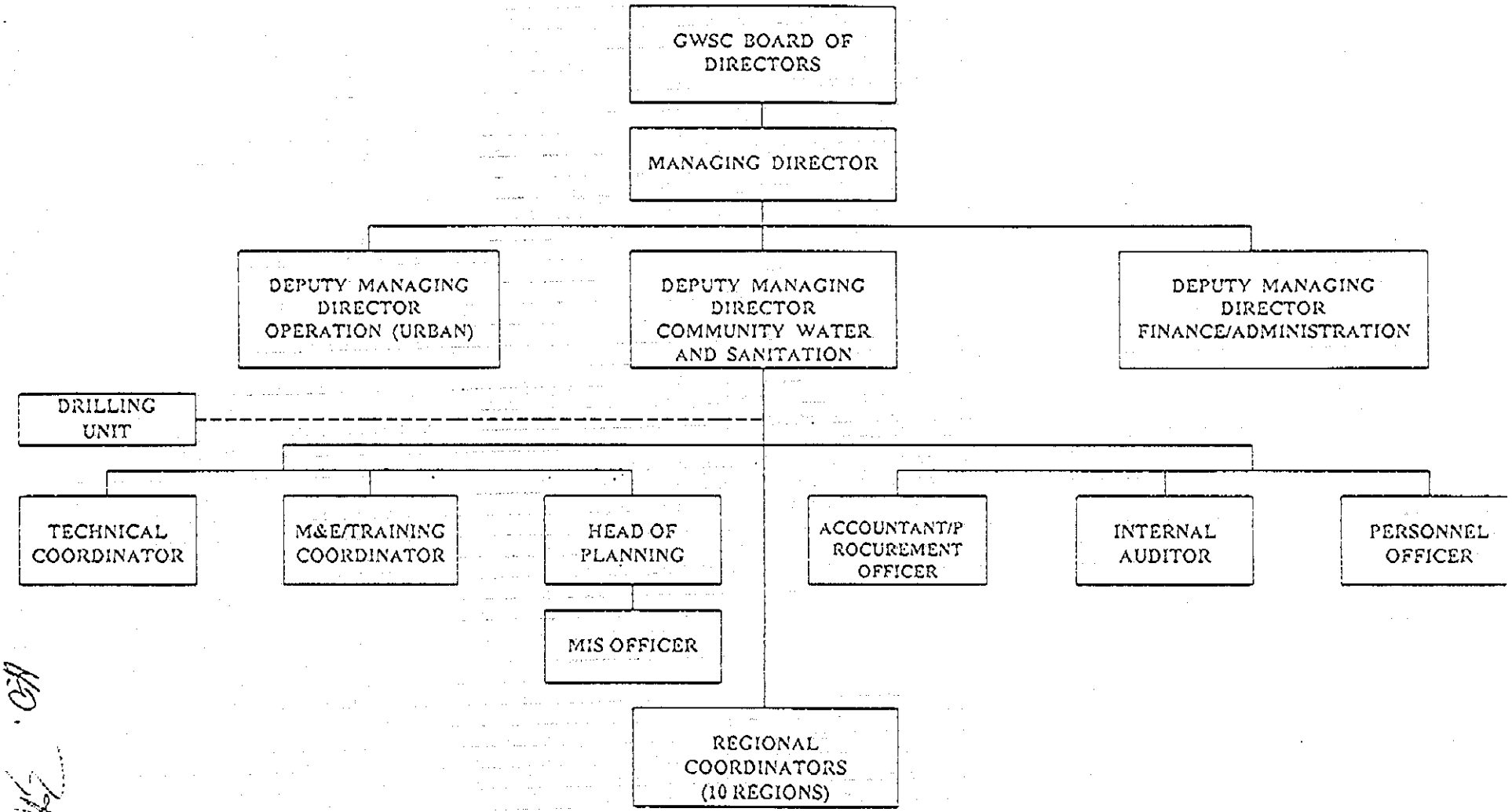
REGION; EASTERN
DISTRICT; SUHUM/KRABOA/COALTAR

No.	Communities
1	Aye
2	Budu
3	Densuso
4	Doe
5	Dome
6	Essusem Agya
7	Fawotiri Kosie Besiase
8	Huanabenya
9	Hwereso
10	Hwereso No. 1
11	Kentenkeri
12	Kromameng
13	Kwabena Kumi
14	Kwaboanta Ada
15	Kwabonata-Ogbolu
16	Kyekyewere
17	Maminhyeaso
18	Mankrong Junetin
19	Meawahi
20	Nanako No.1
21	Nanakor
22	Oboase No.1
23	Obouho
24	Obretema
25	Ohyame Bekyere
26	Oworam
27	Owuwase No.1
28	Praprababida
29	Praprabadida Srah
30	Sawa
31	Simatave
32	Sumui
33	Tetek Nku
34	Tete Kasum
35	Tetteh Nkwanta
36	Yaw Kokor
37	Adiembra
38	Adotim
39	Ahwirenkrom
40	Amaakeo

REGION; EASTERN
DISTRICT; FANTEAKWA

No.	Communities
1	Asuyereye
2	Bepoase
3	Besebuom
4	Bosq-Odumase
5	Bosomtwe-Upper
6	Dede-Sewirako
7	Dome
8	Dominase
9	Etwento
10	Gyampomani
11	Juaso-Akim
12	Koradaso
13	Kumfere
14	Meryiwa-Kwahu
15	Mpamu
16	Ntes No.1
17	Obooho
18	Oborobaho
19	Ofosukrom
20	Ohuku
21	Papramandang
22	Petefuo
23	Pimpimso
24	Sukuma
25	Amoaku
26	Asikam
27	Dkyi
28	Kukubi
29	Tadieso

Annex 2 ORGANIZATIONAL CHART - COMMUNITY WATER AND SANITATION DIVISION



Annex 3 List of Equipment and Materials

A. List of Equipment for Community Education

Description	Quantity
1. 4WD Double-Cabin Pick-Ups	3
2. Audio Visual Equipment	3
3. public Address System	3
4. Microscopes slides and slide projector with accessories	2
5. Video Camera c/w accessories and films	2
6. Motor Bikes	10

B. List of Equipment for Technical support for Operation and Maintenance of Handpumps

B-1 Equipment for Area Mechanics

Description	Quantity
1. Motorbike	20
2. Pipe wrench 2"- 4"	40
3. Nose pliers	20
4. Tyre lever	20
5. Pipe Lifter	20
6. Pipe clamp for installation	20
7. Vice grip	40
8. Flat spanner 17x19	40
9. Combination spanner	20
10. Ring spanner 18 x 19	20
11. Ring spanner 24"	20
12. Ring spanner 20 x 22	40
13. Wrench for tightening pipes	40
14. Flat file	20
15. Hacksaw frame with blade	20
16. Center punch	20
17. Wire brush	20
18. Large screw driver	20
19. Grease gun	20
20. Tape measure	40
21. Tool box	20
22. Padlock with key	20
23. Rod lifter	20
24. Mallet hammer	20
25. Hammer	20

B-2 Tools for Caretaker

Description	Quantity
1. Ring spanner 18 x 19	450
2. Ring spanner 24"	450
3. Ring spanner 20 x 22	450

Annex 4 Japan's Grant Aid

1. Grant Aid Procedures

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

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

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

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

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

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

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

2. Basic Design Study

1) Contents of the Study

The aim f the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to

provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows;

a) Confirmation of the background, objectives, and benefits of the requested Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
d) Preparation of a basic design of the Project
e) Estimation of costs of the Project

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

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

2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA select (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA. The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and

transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

2) Exchange of Notes (E/N)
Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed. However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

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

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

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

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

6) Undertakings required of the Government of the Recipient Country
In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:

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

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

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

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

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

(6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

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

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

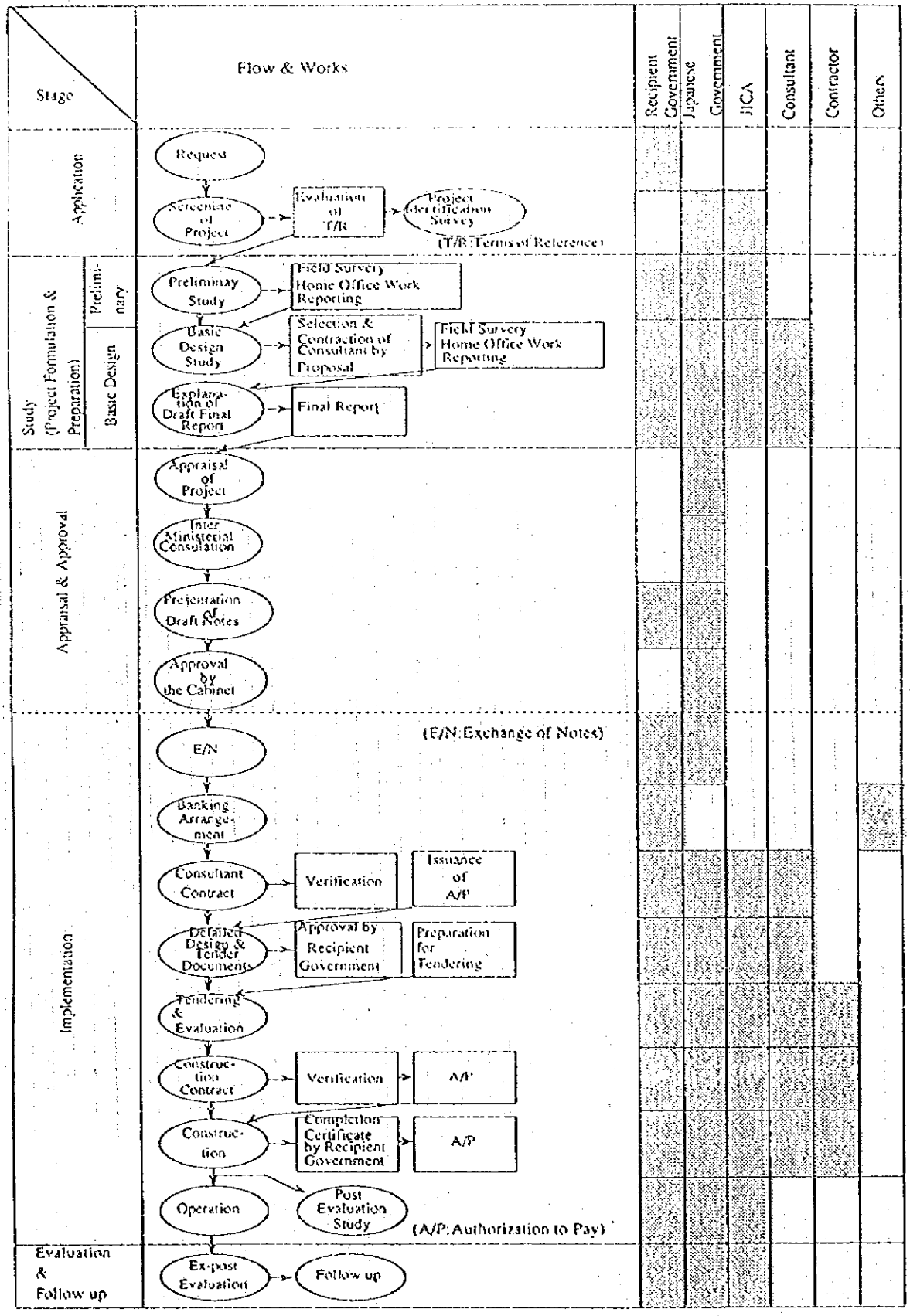
(9) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations

incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

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

4. Flow Chart of Japan's Grant Aid Procedures



5. Major Undertaking to be taken by Each Goverment

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

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY
ON
RURAL WATER SUPPLY PROJECT PHASE III
IN
THE REPUBLIC OF GHANA

(CONSULTATION ON DRAFT REPORT)

In October 1995, the Japan International Cooperation Agency (JICA) dispatched Basic Design Study Team on the Rural Water Supply Project Phase III to the Republic of Ghana, and through discussions, field survey and subsequent technical examination of the results in Japan, has prepared the Draft Report of the study.

In order to explain the Draft Report to the Government of Ghana, JICA sent another team to Ghana , which was headed by Mr. Hidetomi Oi, Development Specialist, JICA from February 15 to 23, 1996.

As a result of discussions, both parties have confirmed the main items as in the attached sheets.

Accra, February 22, 1996

Mr. Hidetomi Oi
Leader,
Draft Report Explanation Team,
JICA

Dr. William ADOTE
Director,
International Economic Relations
Division, Ministry of Finance

Mr. E. K. Y. DOVLO
Managing Director,
Ghana Water and Sewerage
Corporation

ATTACHMENT

1. Components of the Draft Report

The Government of Ghana has agreed and accepted in principle the components of the Draft Report proposed by the Team.

2. Japan's Grant Aid System

Government of Ghana has understood Japan's Grant Aid System, especially the necessary measures to be taken by the government of Ghana, as explained by the Team. Details of the system are given in Annex 1.

3. Further Schedule

The Team will complete the Final Report and send it to the Government of Ghana by the end of April 1996.

4. Others

(1) The Team requested that steps, especially those relating to the contracts with Japanese consultant and contractor should be taken by the Government of Ghana without delay according to implementation schedule, and this was accepted.

(2) The Government of Ghana requested that one motorbike would be procured for each of the ten districts involved in the project for use by the District Water and Sanitation Teams for the Community Education Activities in cooperation with local consultants and also monitoring the operation and maintenance of the water supply facilities; accordingly, the number of motorbike for Community Education Activities would be increased from 6 to 10.

Japan's Grant Aid Scheme

1. Grant Aid Procedures

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

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

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

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

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

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

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

2. Basic Design Study

1) Contents of the Study

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

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

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

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

d) Preparation of a basic design of the Project

e) Estimation of costs of the Project

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

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

2) Selection of Consultants

For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA select (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.
The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

3. Japan's Grant Aid Scheme

1) What is Grant Aid?

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

2) Exchange of Notes (E/N)

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

3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.
However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

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

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

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

5) Necessity of "Verification"

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

6) Undertakings required of the Government of the Recipient Country

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

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

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

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

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

(5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with

respect to the supply of the products and services under the Verified Contracts.

(6) To accord Japaneses nationals whose services may be required in connection with the supply of the products and services under the Verified contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

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

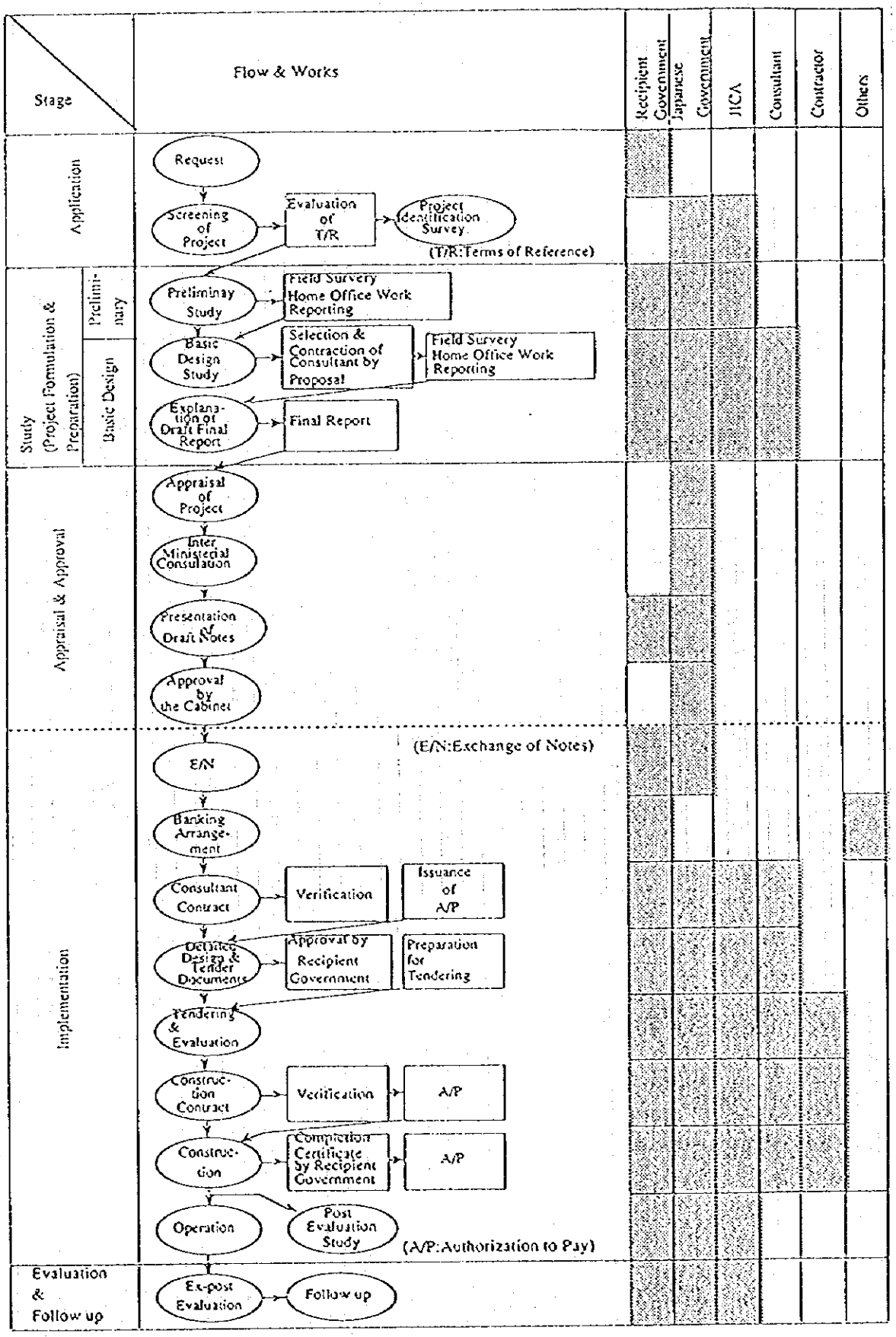
(8) "Re-export"
The products purchased under the Grant Aid should not be re-exported from the recipient country.

(9) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.

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

Flow Chart of Japan's Grant Aid Procedures



Major Undertaking to be taken by Each Goverment

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