CHAPTER 3 IMPLEMENTATION PLAN

CHAPTER 3 IMPLEMENTATION PLAN

3-1 Implementation Plan

3-1-1 Implementation Concept

The concept for the implementation of the Project are explained below.

(1) The Project will be implemented with the MOIWD (Water Department) acting as the implementation body in accordance with the established system for the Japanese grant aid.

(2) Work relating to the detailed design, tender process, supervision of the procurement of borehole construction machines, equipment and materials and supervision of the borehole construction work will be conducted by a Japanese consultant pursuant to Japanese grant aid system.

(3) The procurement and delivery of the borehole construction machines, equipment and materials and the borehole construction work (including on-the-job training) will be conducted by a Japanese contractor.

(4) The MOIWD will provide capable local staff, who will participate in on-the-job training to be provided by the contractor, available prior to the commencement of the borehole construction work.

(5) The MOIWD will provide the necessary manpower to implement the Project throughout the Project period.

(6) Tax exemption and other necessary measures vis-a-vis machines, equipment and materials imported for Project purposes will be put into effect with the cooperation of Malawi's Ministry of Finance.

(7) The MOIWD will make all necessary arrangements vis-a-vis locally procured materials so that the supply of these items is given priority to follow the Project implementation schedule.

3-1-2 Implementation Conditions

It is essential that the Malawi side completes the following work prior to the delivery of the borehole construction machines, equipment and materials.

(1) Determination of the 300 borehole locations through discussions with local inhabitants and taking the hydrogeological data obtained by the electric prospecting conducted by the consultant into consideration.

(2) Construction or repair of access roads to the borehole locations and provision of material (sand and laterite for road work as well as ground preparation at the prospective borehole sites) furnished by beneficiaries as soon as such locations are determined.

(3) Securing of a 3,000m^2 for the base camp planned at Bulala prior to the commencement of the borehole construction work to serve as a local base (office and workshops) and preparation of the ground with laterite etc.

(4) Arrangement of an machinery and equipment repair service at the Workshop of the MOIWD in the case of large-scale repair work being required although mechanical problems during the borehole construction work should be solved on site using the tools and spare parts to be procured for maintenance and repair purposes under the Project.

(5) Securing of capable and experienced local staff (in sufficient number to organize two teams) to participate in on-the-job training.

(6) To obtain the permission from the competent authority for the frequency range of the radio communication equipment to be procured.

(7) To organize a Water Management Committee in advance at each borehole drilling site, and to implement the enlightening activities for improving the consciousness among the inhabitants with the meaning of the Project, public hygiene, and maintenance and management of the boreholes.

3-1-3 Scope of Works

The scope of works to be carried out by the Japan and Malawi sides is as indicated in Table 3-1-3-1.

Table 3-1-3-1 Scope of Works

Work Area	Japan Side	Malawi Side
1. Securing, clearing, leveling and reclamation of site land for the base camp (including workshop site land) and construction of the boreholes		○
2. Construction of access roads (including rehabilitation of bridges) to the base camp and borehole sites		○
3. Procurement of equipment and materials required for construction of the boreholes	○	○*1
4. Construction of the workshop	○	
5. Construction of 300 boreholes (including ancillary facilities)	○	○*2
6. Erection of fences and gates around the completed boreholes		○

*1 Provision for use in the Project of the two drilling machines, etc. that were procured through Japan's Grant Aid in the past.

*2 Bearing of the costs incurred by the participation (on-the-job training) of technicians from the Malawi side in the borehole construction works.

3-1-4 Consultant Supervision

With the signing of the consultancy agreement following the signing of the Exchange of Notes, the consultant will prepare the detailed design, prepare the tender documents and conduct the tender process on behalf of the Government of Malawi. Following the selection of the contractor, the consultant will supervise the procurement of the borehole construction machines, equipment and materials and also supervise the borehole construction work.

(1) Implementation Design

Detailed geophysical prospecting is to be implemented at the villages subject to drilling the boreholes as specified in the basic design in order to prepare the implementation design report which clearly specifies the drilling site of the boreholes and drilling depth and to obtain the approval by the Government of Malawi.

(2) Preparations of the Tender Documents

To prepare the documents required for the tender, to prepare the implementation design document based on the results of (1) above, and to discuss their contents with the Government of Malawi to obtain its approval.

(3) Execution of Tender Work on Behalf of the Government of Malawi

On behalf of the Government of Malawi, the consultant will conduct the public announcement of tender, acceptance of tender application forms, meeting to explain the tender procedure, distribution of tender documents, acceptance of tenders and analysis and evaluation of tenders. In addition, the consultant will provide advice in regard to the negotiation of the construction contract between the Government of Malawi and the successful tenderer to assist the completion of an appropriate contract.

(4) Supervision of Procurement and Construction Work

Following the signing of a contract relating to the procurement of machines, equipment and materials and borehole construction work, the consultant will be responsible for the supervision of the procurement and construction work.

In Japan, the consultant will inspect and approve the documents to be submitted by the contractor, inspect and approve the specifications of the items to be procured in Japan and witness the inspection of these items at the respective factories.

In Malawi, the consultant will conduct the final inspection of the delivered equipment and materials, confirm the final locations of the 300 boreholes and conduct work supervision, quality control and material control, etc.

(5) Personnel Plan

The consultant will appoint hydrogeologist (A), hydrogeologist (B) hydrogeologist (C), hydrogeologist (D) for geophysical prospecting and an engineer specializing in the design of borehole construction machines, equipment, materials and borehole facilities in addition to a general manager for the detailed design. The consultant will dispatch comprehensive supervisor, and concurrent hydrogeologist and work supervisor.

3-1-5 Procurement Plan

The local market survey in Malawi found some of the borehole construction materials, notably cement, gravel, sand, laterite, filtering materials, bricks, reinforcing bars, casings and screens, to be locally available. However, other materials must be imported.

The following procurement decisions have been made based on a study of the financial situation of the Government of Malawi and the economy as well as on the quality of the products.

(1) Items to be Procured Locally

1) Cement, Gravel and Others

Cement will be supplied by a cement company located in Mzuzu. Gravel, sand and laterite are readily available on site. An adequate amount of good quality filtering materials will be obtained from sand collecting point at Chilumba owned by the MOIWD on the shore of Lake Malawi.

2) Bricks

Bricks are the most typical construction materials in Malawi and are readily available from Malawi's many brickworks. There are two types of bricks depending on the use of wooden or steel moulds.

3) Reinforcing Bars

Reinforcing bars are constantly imported from South Africa and are readily available.

4) Petrol and Light Oil

Both petrol and light oil are imported from South Africa and there is no sign of a shortage.

5) Casings and Screens

Both casings and screens will be supplied from a local manufacturer's plant in Lilongwe. The production quantity and quality are both good and the plant is capable of meeting a small quantity order within a short delivery time to prevent the deterioration of the products during storage at the site.

(2) Items to be Imported

1) Mud Water Agent

Bentonite is generally used as a mud water agent. As bentonite is inavailable in Malawi, however, a substitute, which is a chemical product capable of the same performance as bentonite with a smaller quantity and which is much cheaper than bentonite (approximately 11-15% of the cost of bentonite, inclusive of transportation cost), will be imported from Japan.

2) Borehole Drilling Machines and Equipment

Functions, quality, future prospect, readily availability of the parts, after-sale services, and price of the machines need to be reviewed upon procuring them since there are many machines involved in the borehole drilling and majority of them have compatibility from one to another. For the drilling machine being as the main machine, readily availability of the spare parts is an important requirement in order to assure its effective uses in the future for a prolonged period of time after completing the Project. In order to satisfy the requirement, the drilling machine must be made by a third country manufacturer who has an existing representative in Malawi upon receipt of the order or a Japanese manufacturer, whichever has an agent in Malawi or is subjected to establish an agent in Malawi after contract.

3) Afridev Handpumps

Afridev handpumps are not manufactured in Japan and local production is not yet operational. Therefore, the Afridev handpumps will be imported from India which has a good Afridev handpump supply performance from both the quantity and quality aspects.

4) Survey Equipment

The survey equipment will be imported from Japan.

5) Vehicles

The vehicles, including the pumping test machine and light vehicles and excluding those related to the drilling machine itself, will be procured in Japan and exported to Malawi since the compressor and radio equipment etc. must be assembled and mounted on them in Japan.

(3) Labour

Several drilling companies operate in Malawi, all of which with only one exception use percussion rigs. Given their working capacity, however, they are generally overloaded with work. At the same time, none of them is capable of allocating an engineer for the Project since all of them plan to participate in the IDA's National Water Development project (3,000 borehole construction and 1,000 borehole rehabilitation work) which is scheduled to be ordered in 1997. The recruitment of operators for the rotary/air-hammer drilling machine to be used for the Project, therefore, appears difficult even though there are operators in Malawi who are conversant with drilling work. Given these conditions, while workers will in principle be recruited locally, engineers to perform the key roles in the fields of technical control, work control and repair/maintenance of the procured machines and equipment will be dispatched from Japan because of the following reasons.

1) The borehole construction work, which is at the centre of the Project-related construction work, must be efficiently conducted in order to complete the planned number of boreholes within a limited period using the procured rotary/air-hammer drilling machine. It would be difficult for operators who are unfamiliar with this type of rig to satisfy these conditions.

2) The transfer of technology in a wide range of fields, including operation of the new rig, to operators/engineers of the MOIWD (some with experience of the rotary rig and others without) is necessary during the construction period.

3) Two of three drilling teams will use the existing rigs, other machines and equipment, including vehicles, of the MOIWD which were procured by Japan in 1989 and 1992. The repair and maintenance (mainly of the drilling machine and vehicles) is essential in view of the smooth commencement of the construction work. Moreover, it is crucial that the machines and equipment be constantly checked to keep it in working order for the successful completion of the Project.

3-1-6 Implementation Schedule

The Project can be divided into two stages; the first stage for the implementation design and the second stage for the procurement of the machines and materials and implementation of the borehole construction.

In the first stage, the MOIWD and a Japanese consultant will conclude a consultation agreement related to the implementation design of the Project after signing the Exchange of Notes (E/N).

The on-site survey will be implemented to select the borehole site and drilling depth after concluding the consultation agreement. The implementation design report will be prepared based on the survey result and submitted to the MOIWD. It is estimated that it will take 4.0 months from the signing of the E/N to the submittal of the report.

In the second stage after signing the E/N, the MOIWD and a Japanese consultant will conclude a consultation agreement related to the Project. The consultant will then prepare the tender documents, including the specifications and will conduct the tender process to select a Japanese contractor responsible for the delivery of the machines, equipment and materials and also for the construction of the boreholes upon receipt of approval of the above documents by both governments. The consultant will also be present at the signing of the construction contract between the Government of Malawi and the successful tenderer (contractor). It is estimated that it will take 2.0 months from the signing of the E/N to the signing of the construction contract.

Manufacture and delivery of the machines, equipment and materials will be procured and delivered in three stages; ⓐ mainly the spare parts for the existing machines, and borehole materials and equipment, ⓑ vehicles, and ⓒ machine and materials to be newly procured.

The stage ⓐ will require 2.5 months for the manufacture and procurement of spare parts and tools, 1.5 months for marine transportation, 1 month for customs clearance and land transportation and 0.5 months for inspection and final delivery while it will take 4.0 and 5.0 months to manufacture and procure ⓑ and ⓒ, respectively, and thereafter the similar period of time for ⓐ after the marine transportation.

In short, it will take 7.5 months from the signing of the E/N to the delivery of the spare parts and tools for the existing machines and equipment. A further 2.5 months will be required for work preparation (repair and adjustment of existing machines and equipment) before the actual commencement of the drilling work.

In addition, it is necessary to complete the construction of the workshop as the base camp during the preparatory work period, which will be available upon commencement of the borehole construction since it will take approximately 6 months after concluding the contract with the construction contractor.

For the first year, 180 boreholes will be constructed using the two drilling machines to be borrowed from the Government of Malawi and another machine to be newly procured for the Project, which will take one year.

For the second year, 120 boreholes will be constructed using the one drilling machine to be borrowed from the Government of Malawi and another machine to be newly procured for the Project, which will take another one year.

The above implementation schedule consisting of different phases and stages is compiled in Table 3-1-6-1.

3-1-7 Obligations of Recipient Country

The items to be borne by the Malawi side in the course of implementation of the Project are as indicated below.

(1) To provide data and information required for implementation of the Project.

(2) To secure, clear, level and reclaim the sites required for construction of the workshop and boreholes.

(3) To construct the access roads to the workshop and borehole sites.

(4) To erect the fences and gates around the completed boreholes.

(5) To provide facilities for distribution of electricity, water supply and drainage, etc. to the workshop site.

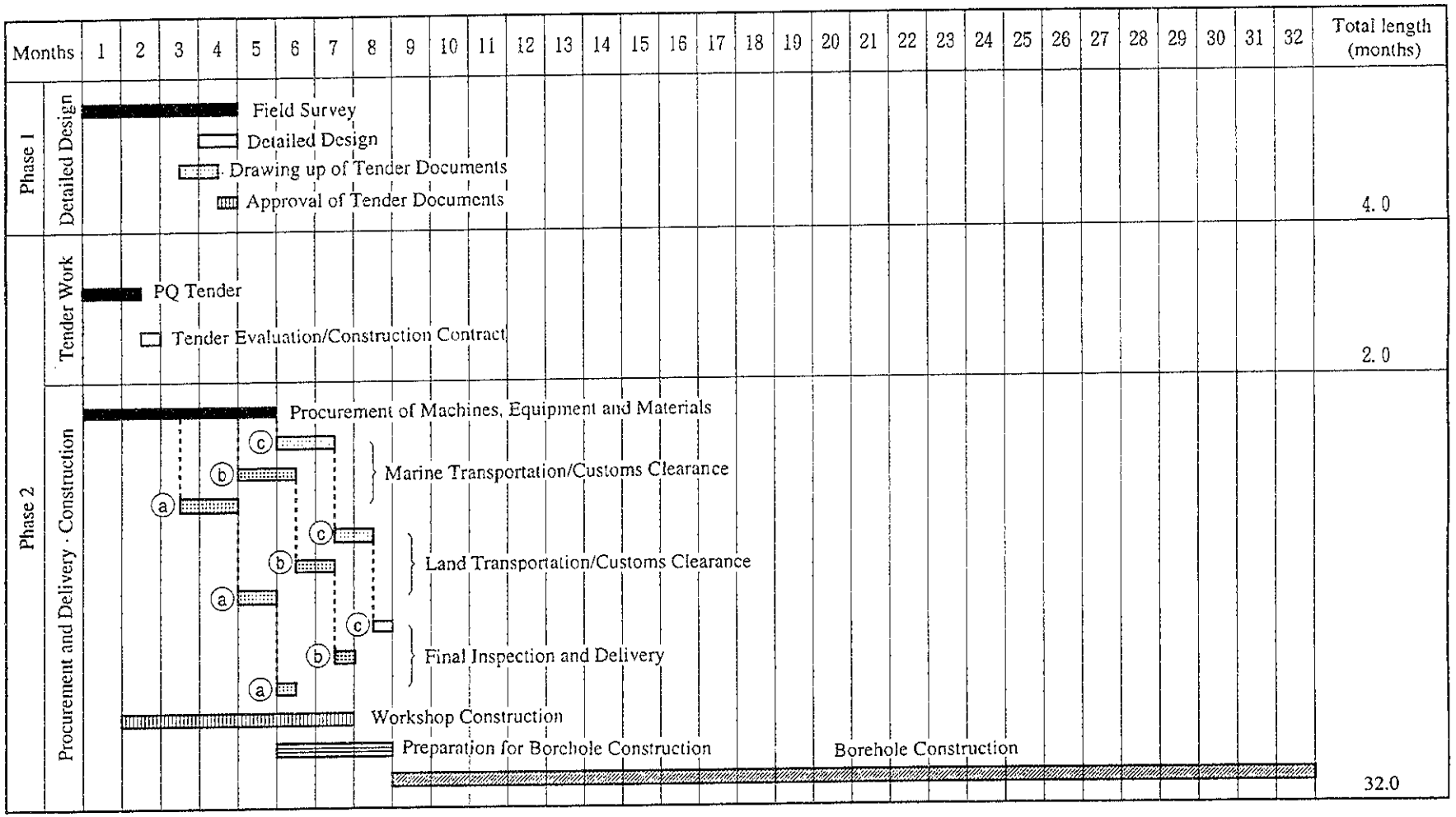
(6) To bear two kinds of commissions to the Japanese foreign exchange bank for the banking services, based upon the "Banking Arrangement", namely, the advising commission of the "Authorization to Pay" and payment commission.

(7) To ensure prompt unloading and customs clearance at the port of disembarkation in Malawi and facilitate internal transportation therein of products purchased under the Grant.

(8) To exempt taxes and to take necessary measures for customs clearance of materials and equipment brought for the Project at the port of disembarkation.

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

Table 3-1-6-1 Project Implementation Schedule



Remarks ⓐ : Spare parts for previously procured machines, equipment and materials, and procured equipment and materials for borehole and workshop construction.
ⓑ : Vehicles
ⓒ : Equipment and materials fo newly procured

(10) To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Malawi with respect to the supply of the products and services under the Verified Contract.

(11) To provide necessary permissions, license and other authorization for carrying out the Project.

(12) To bear all expenses other than those to be borne by the Grant Aid, necessary for the implementation of the Project.

(13) To maintain and use properly and effectively the equipment and materials purchased under the Grant.

(14) To assign the necessary staff and secure the necessary budget for operation and maintenance of the equipment procured under the Grant.

(15) To maintain the control of tools and spare parts purchased under the Grant.

(16) To purchase necessary spare parts by Malawi's own budget after completion of the Project and to execute periodic overhaul.

3-2 Operation and Maintenance Plan

The operation and maintenance plan for the Project mainly consists of two components, i.e. boreholes as water supply facilities and maintenance of the borehole construction machines and equipment. As the maintenance system must be operational immediately following the completion of the Project, it is a determining factor in the Project's success. In particular, it is necessary to establish the system in parallel with the construction of a given borehole so that it can be readily used immediately after the completion due to the urgent needs for it.

3-2-1 Water Supply Facility Maintenance System

The MOIWD has been trying to achieve the wide adoption of the VLOM (Village Level Operation and Maintenance) system by selecting the easy-to-maintain Afridev handpump and plans to adopt the VLOM system for the boreholes to be constructed under the Project (see Fig. 3-2-1-1). The VLOM system has two operational components, i.e. dealing with daily maintenance at a village level and dealing with organizational activities to establish the system and also finding solutions to social, economic and technical problems, as described below.

(1) Daily Maintenance

The MOIWD promotes the CBM (Community Based Management) program that includes promoting the establishment of the Village Water Committee (V.W.C.), holding lectures related to the maintenance techniques, health, and hygiene, and monitoring these activities by transferring the ownership of the completed borehole to the voluntary management organization formed by the users so that it will be voluntarily maintained by themselves.

The daily maintenance for the borehole is implemented by the Pump Caretakers (P.C.) which consist of three inhabitants (with two or more females) who are selected from the 10 V.W.C. members to be established at each borehole site and have received the lectures related to the pump maintenance, health, and hygiene.

The lecturers to the V.W.C. are given by the CBM team of the MOIWD. Any major repair beyond the capability of the P.C. is comprehensively implemented by the Maintenance Section of the MOIWD.

In addition, the services by the P.C. and V.W.C. are offered at no charge, and the consumable items are purchased from the money collected from the borehole users by the V.W.C.

1) P.C. voluntarily conduct daily checks and simple repairs in accordance with the items specified in the maintenance book (daily log book) and are also responsible for the cleaning of areas around the boreholes and other hygienic measures.

2) In case a given repair can not be made by the P.C., the assistance is provided by the Water Monitoring Assistant (W.M.A.) dispatched from the CBM team of the Groundwater Section of the Department of Water (one W.M.A. is assigned for each 100 boreholes).

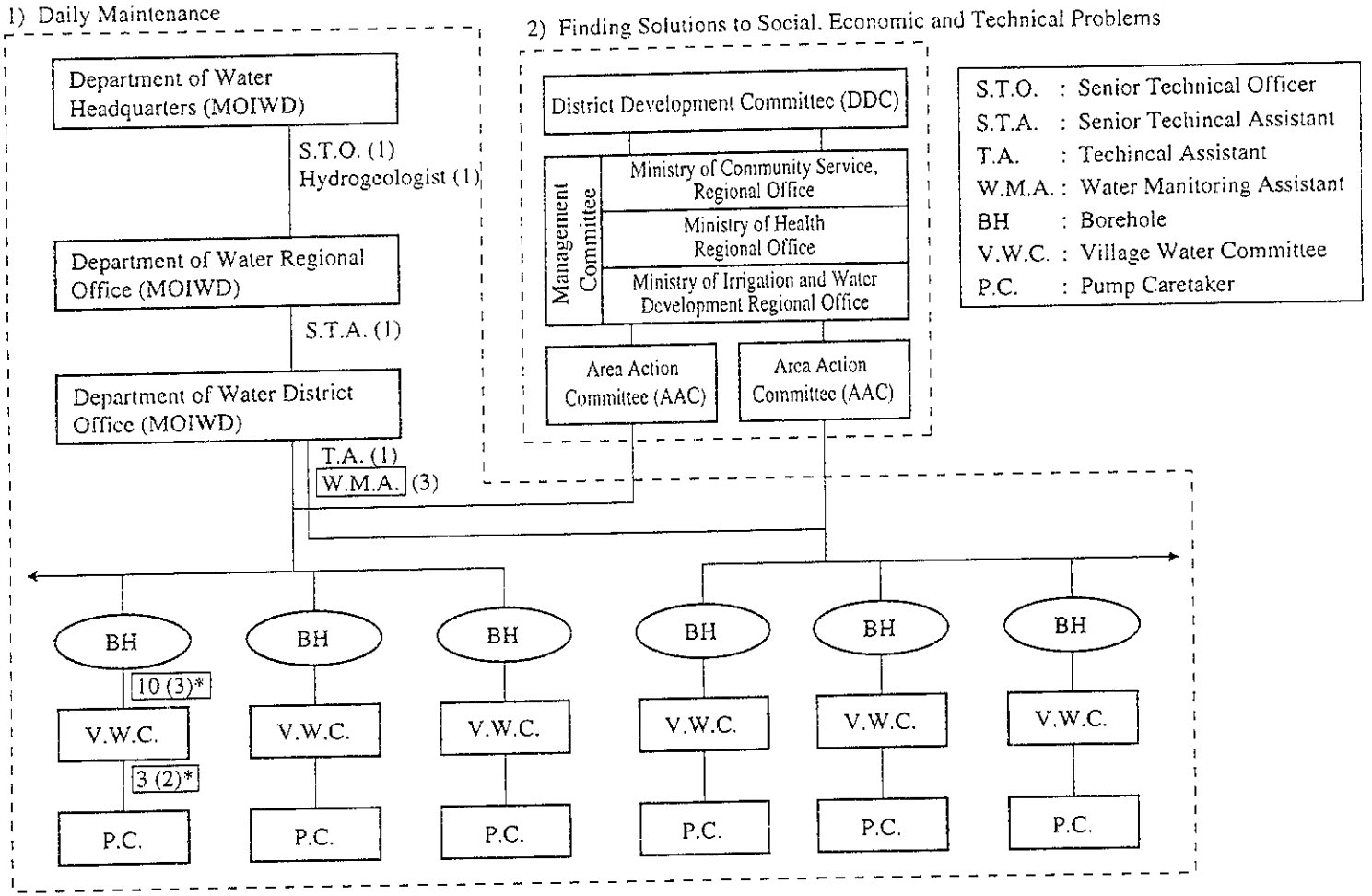
3) When it is not possible even for the W.M.A. to repair a given failure, he reports it to the Central Maintenance Section located at the District Government Office to obtain its assistance.

The voluntary maintenance by the village inhabitants themselves are being implemented in the Project Area, and the achievements by the CBM activity being as the rehabilitation project of IDA are also confirmed. Further, it has also been confirmed that there are four Chipiku Stores (nationwide retailer) that sells the spare parts for the pump in the Project Area, and a set of the consumable items is sold at the Government's control price of K138.

(2) Organization of Activities and Solving of Social, Economic and Technical Problems

The committee at the village is organized as the Village Health and Water Committee, which covers promotion of water related health and hygiene in addition to procuring the funds, purchasing the spare parts, and assuming the responsibility to maintain the hand pump based on the technical assistance provided by the following promotion and maintenance staff members of the respective ministries of the government. A CBM Operating Committee is established in each district, which consists of the representatives from the Ministry of Irrigation and Water Development, Ministry of Community Service and Ministry of Health. Further, District Development Committee (DDC) is established at the regional government to promote the development projects in the district and to settle the problems arising out of such projects.

The key to this approach is how to motivate the inhabitants to have the affection to the borehole and to make them voluntarily operate and maintain it with responsibility. For this purpose, it is important that all the inhabitants participate in selection of the borehole site and the borehole construction work so that they will realize that "it is their own borehole and pump".



* Numerical values in the parentheses ( ) represent the number of females.

Fig. 3-2-1-1 Village Level Organization for Managing and Maintaining the Borehole (VLOM)

(3) Running Cost

The annual maintenance cost of the water supply facility includes the following labor costs and water supply maintenance costs.

These costs are those reviewed under item 2-2-2, which are believed to be within the range affordable from the general budget of the Department of Water.

(4) Cost for the enlightenment activities

Although the Village Water Committee is responsible for implementing daily maintenance and purchasing the spare parts, the MOIWD has the obligation to enlighten the inhabitants with the maintenance techniques that assure prolonged usage of the completed borehole. At the same time, it is also necessary that it promotes the education activity as an indispensable portion of the program to hygienically use the water according to the original purpose to supply hygienic daily water needs. Further, it is also necessary to guide the village inhabitants so that the voluntary operation and management will be implemented in a democratic manner since the borehole contributes to the mutual benefit of the inhabitants themselves.

From this standpoint, the CBM program is jointly promoted by the Management Committee consisting of the representatives from the MOIWD, Ministry of Health, Ministry of Community Service, and District Development Committee.

The District Development Committee shall administer such issues within its district as the development projects as well as the matters regarding the projection.

A general CBM program includes promotion of the establishment of Village Water Committee and holding lectures for the selected committee members.

The following activity costs are required for the 300 boreholes to be constructed by the Project.

① To promote establishment of the Village Water Committee and to instruct the selected committee members (at 300 villages)

Basic salary for the enlightening staff member:

3 persons × 50 days × K 50	= K 7,500
Allowance for the same:	
3 persons × 50 days × K 160	= K 24,000
Fuel cost (motorcycle):	
5 liters × 3 motorcycles × 50 days × K 10 per liter	= K 7,500
Maintenance cost of the motorcycle (oil):	
9 liters × K 47 per liter	= K 423
Total of ①	= K 39,423

② Costs and fees to hold the lectures (Five days per lecture at five villages, a total of 60 lectures)

[Costs and fees to hold a lecture]

Lunch for the participants (committee member village headman):	
55 persons × K 20 × 2 days	= K 2,200 (Introduction and hygiene)
Lunch for the participants (pump manager):	
15 persons × K 20 × 3 days	= K 900 (Pump management)
Daily allowance for the instructors (staff members):	
3 persons × K 160 × 2 days	= K 960 (Introduction and hygiene)
Daily allowance for the instructors (staff members of the Department of Water):	
1 person × K 160 × 3 days	= K 480 (Pump management)
Daily allowance for the staff members (driver and accountant):	
2 persons × K 160 × 6 days	= K 1,920
Fuel cost (pickup truck):	
60 liters × 1 truck × 6 days × K 10 per liter	= K 3,600
Stationery:	K 725
Spare cost (10% of the above):	K 1,080
Daily allowance for the supervisor:	
1 person × K 240 × 4 days	= K 920
Total cost for one lecture:	K 12,785
Total for 60 lectures:	K767,100
Basic salary of the staff member (exclusive):	
1 person × K 1,000/month × 24 months	= K 24,000
Basic salary of the staff member (hygiene):	
2 persons × K 1,000/month × 24 months/2	= K 24,000
Total basic salary:	K 48,000
Total of ② for implementing the lectures:	K815,100
Grand total (① and ②):	K854,523

The enlightenment activity cost needs to be paid for two to three years considering that it needs to be commenced somewhat earlier than commencing the borehole construction work of the Project and promptly finished upon completion of the work.

3-2-2 Maintenance System for the Machines and Equipment

The two sets of borehole construction machines and equipment, including drilling machines, which were provided by Japan in 1989 are currently allocated to the Central and Southern Regional Offices, and another set procured in 1992 is allocated to the Central Regional Office. Upon completion of the Project, the allocations of all the drilling machines will be reviewed to allocate that of 1989 to the Central Regional Office, that of 1992 to the Northern Regional Office, and the new one to the Southern Regional Office.

There are 28 staff members stationed at the Southern Regional Office who are sent from the Construction Unit of the Groundwater Section stationed and responsible for maintaining these machines and equipment. And, the drillers who are to receive the on-the-job training are to be relocated at the Southern Regional Office together with the machine when it is relocated. Since the Southern Regional Office is equipped with the workshop, a maintenance system has been established that permits implementation of simple repair work. A system has been established to have any failure repaired by a well equipped private repair companies in Lelongwe and Blantyre if a given failure can not be repaired at the Regional Office.

In conclusion from the above, the Ministry of Irrigation and Water Development possesses ample organization and staff to operate and maintain the procured drilling machine and other equipment. Furthermore, because the IDA National Water Development Project, which involves the further drilling of 3,000 boreholes, etc., is scheduled for implementation following the completion of the Project, it is likely that ample funds will be secured for the purchase of spare parts, etc. needed for operation and maintenance.

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

4-1 Project Effect

The Project is a BHN project that will contribute to enhancing the daily lifestyles of rural residents who are currently struggling to obtain domestic water. Moreover, the implementing agency, the Ministry of Irrigation and Water Development, possesses the necessary staff and setup for Project implementation. Furthermore, because the Project will contribute to the attainment of the following national and regional development project goals, its implementation under the Grant Aid Scheme of the Government of Japan is judged to be appropriate.

① In order to achieve the target 74% water supply rate in rural areas of 74%, as put forward in the National Water Service Development Plan (1994-2010), it is necessary to construct 14,900 boreholes by 2010. Malawi is currently working towards the attainment of this target with the help of aid from international agencies and advanced nations. However, although aid has been secured for the construction of 3,766 boreholes, a further 10,000 and more boreholes are still needed. In these circumstances, a great deal is expected from Japan's aid.

The requested Project will play an important role in aiding the achievement of the aforementioned national development plan target.

② As Mzimba District possesses fertile land and contains the large food consumption area of Mzuzu, it is regarded as an important area within Malawi as it strives to make agricultural development one of its priority policies. Mzimba has been designated as a model district within the Mzimba District Physical Development Plan (OPC/UNDP/UNCHS: 1987), which touches on the need for development of the infrastructure in all areas including agriculture, industry, traveler services, employment, population distribution, urban functions, land use, transportation, electric power, domestic water supply, medical and educational facilities, posts and the telephone service, etc. However, a lack of development is particularly conspicuous in the area of water supply facilities, which are the most fundamental of all infrastructure services in the daily lives of regional residents. For this reason, the Project requires urgent attention.

The specific effects expected to be gained through implementation of the Project are described in the following paragraphs.

(1) The borehole water supply rate in the western region of Mzimba District will rise from 22% to 54% (assuming a beneficiary population of 250 people per borehole). Whereas 100% of residents in villages without borehole facilities have had experience of water-borne diseases, the incidence of such diseases in villages that possess boreholes is almost zero. Thus, the said raising of the water supply rate will make a major contribution in terms of reducing the incidence of water -borne diseases.

(2) Whereas residents currently spend three hours on average and more than four hours in extreme cases drawing water from unsanitary water sources, the construction of boreholes will reduce water drawing times to less than two hours per day.

(3) Construction of the workshop will improve the setup for maintaining both Project and existing wells, thus enabling permanent water supplies to be achieved.

4-2 Recommendation

Attention needs to be paid to the following points in order to make the Project even more effective and further contribute to the achievement of the national target.

(1) Funds for Enlightenment Activities

It is planned that water management committees organized on the village level should be responsible for operation and maintenance of the boreholes constructed under the Project. The Water Department has compiled a CBM Program that covers the encouragement of water management committee organization, seminars on management techniques and education on sanitation matters. Because enlightenment activities based on the CBM Program will be an important area in the event of Project implementation, it is necessary for the MOIWD, as the implementing agency, to secure the necessary budget and carry out appropriate enlightenment activities.

(2) Operation and Maintenance of Boreholes Following Project Completion

The operation and maintenance of boreholes by the water management committees will be monitored by staff of the Water Department, however, in view of the possibility that water management techniques may not be passed on to younger generations in the long-term, it will be necessary to carry out appropriate follow-up activities, for example, the holding of regular seminars, etc. (once every year or so), on a sustained basis.

(3) Promotion of Future Groundwater Development Plans

The water supply rate in rural areas will still only be 54% when the Project is completed. In order to satisfy the national target of 74% by 2010, the construction of a further approximately 550 boreholes will be required in the Project target area alone (taking into account population increase). Thus, implementation of the Project will symbolize no more than just the first step on the road to achieving the national target. In order to realize the national target following completion of the Project, it will be necessary to compile groundwater development plans that accurately reflect population trends, and at the same time carry out appropriate maintenance (regular inspections, replacement of spare parts, etc.) of the drilling machine and other items of equipment provided under the Project so that they can be used for many years in the promotion of those plans.

APPENDICES

Appendix 1 Member Lists of the Survey Team

Appendix 1-(1) Member List of the Basic Design Study Team

Name	Responsible Area	Organization
Yasuo Mukai	Leader	Development specialist, institute for International Cooperation, JICA
Yuichi Sugano	Coordinator	First Basic Design Study Division, Grant Aid Study & Design Department, JICA
Akinori Takaku	Chief Consultant/ Maintenance and Operation Planner	Japan Engineering Consultants Co., Ltd.
Shuro Matsuhashi	Hydrogeologist I	Japan Engineering Consultants Co., Ltd.
Mamoru Shibata	Hydrogeologist II	Japan Engineering Consultants Co., Ltd.
Hiromi Yamagai	Physical Prospecting I	Japan Engineering Consultants Co., Ltd.
Mitsuhiro Hosooka	Physical Prospecting II	Japan Engineering Consultants Co., Ltd.
Tatsuo Takamatsu	Equipment Planner / Procurement Planner	Japan Engineering Consultants Co., Ltd.

Appendix 1-(2) Member List of the Explanation Team for the Draft Basic Design

Name	Responsible Area	Organization
Yasuo Mukai	Leader	Development specialist, institute for International Cooperation, JICA
Yuichi Sugano	Coordinator	First Basic Design Study Division, Grant Aid Study & Design Department, JICA
Akinori Takaku	Chief Consultant/ Maintenance and Operation Planner	Japan Engineering Consultants Co., Ltd.
Shuro Matsuhashi	Hydrogeologist I	Japan Engineering Consultants Co., Ltd.

Appendix 2 Survey Schdule

Appendix 2-(1) Itinerary of the Basic Design Study

No.	Date	Day	Movement	Accommo-dation	Activities
1	Aug. 25	Sun.	Narita (11.30) to Amsterdam (16.45) JL411	Amsterdam	Departure of team leader and Sugano and consultants (Takaku, Matsuhashi, Hosooka, Takamatsu)
2	26	Mon.	Amsterdam (23.40) to → KL563	Aircraft	Transfer
3	27	Tue.	→ Lilongwe (11.20)	Lilongwe	P.M: meeting at the JICA office
4	28	Wed.	Lilongwe	Lilongwe	A.M: Courtesy call on government agencies P.M: Explanation and discussion of IC/R
5	29	Thu.	Lilongwe	Lilongwe	Consultations
6	30	Fri.	Lilongwe to Mzuzu	Mzuzu	Site survey
7	31	Sat.	Mzuzu to Lilongwe	Lilongwe	Site survey
8	Sep. 1	Sun.	Lilongwe	Lilongwe	Team meeting and collection of data
			Narita (11.30) to Amsterdam (16.45) JL411	Amsterdam	Departure of consultant (Yamagai)
9	2	Mon.	Lilongwe	Lilongwe	Minutes consultation
			Amsterdam (23.40) to → KL563	Aircraft	Transfer of consultant (Yamagai)
10	3	Tue.	Lilongwe	Lilongwe	Signing of minutes
			→ Lilongwe (11.20)	Lilongwe	Arrival of consultant (Yamagai)
11	4	Wed.	Lilongwe	Lilongwe	Report to JICA office Consultants: field survey preparation (inspection of test equipment)
			Lilongwe (16.15) to Lusaka (17.30) GQ1506	Lusaka	Transfer of team leader and Sugano
			Narita (11.30) to Amsterdam (16.45) JL411 Amsterdam (23.40) to → KL563	Aircraft	Departure of consultant (Shibata) Transfer of consultant (Shibata)
12	5	Thu.	Lusaka	Lusaka	Team leader and Sugano: report to Japanese Embassy in Zambia, followed by participation in the Water Supply Project in Southern Region in Zambia
			Lilongwe	Lilongwe	Consultants (Takaku, Takamatsu): Data collection
			→ Lilongwe (11.20)		Arrival of consultant (Shibata)
			Lilongwe to Mzuzu	Mzuzu	Consultants: site survey (Matsuhashi, Shibata, Yamagai, Hosooka)
13	6	Fri.	Lilongwe to Mzuzu	Mzuzu	Takaku: Transfer, site survey
			Mzimba District	Mzuzu	Consultants: site survey (Matsuhashi, Shibata, Yamagai, Hosooka)
			Lilongwe to Likuni to Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment
14	7	Sat.	Mzimba District	Mzuzu	Takaku, Matsuhashi, Shibata, Yamagai, Hosooka (A): site survey
			Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment
15	8	Sun.	Mzuzu	Mzuzu	(A): team meeting
			Lilongwe to Likuni to Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment
16	9	Mon.	Mzimba District	Mzuzu	(A): Site survey
			Lilongwe to Likuni to Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment
17	10	Tue.	Mzimba District	Mzuzu	(A): Site survey
			Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment
18	11	Wed.	Mzimba District	Mzuzu	(A): Site survey
			Lilongwe to Kasungu to Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment

No.	Date	Day	Movement	Accommo-dation	Activities
19	12	Thu.	Mzimba District	Mzuzu	(A): site survey
			Lilongwe to Zomba to Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment
20	13	Fri.	Mzimbe District	Mzuzu	(A): site survey
			Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction related equipment
21	14	Sta.	Mzimba District	Mzuzu	(A): site survey
			Lilongwe	Lilongwe	Takamatsu: Investigation of borehole construction-related equipment
22	15	Sun.	Mzimba District	Mzuzu	Matsuhashi, Shibata, Yamagai, Hosooka (B): site survey
			Mzuzu to Lilongwe	Lilongwe	Takaku: transfer
			Lilongwe	Lilongwe	Takamatsu: arrangement of data
23	16	Mon.	Mzimba District	Mzuzu	(B): site survey
			Lilongwe	Lilongwe	Takaku, Takamatsu (C): Interim report to JICA office, investigation of borehole and work shop constructions-related materials
24	17	Thu.	Mzimba District	Mzuzu	(B): site survey
			Lilongwe	Lilongwe	(C): Investigation of borehole and work shop construction-related materials, collection of data
25	18	Wed.	Mzimba District	Mzuzu	Matsuhashi, Shibata, Hosooka (D): site survey
			Lilongwe	Lilongwe	(C): Collection of data
			Mzuzu to Lilongwe	Lilongwe	Yamagai: transfer, collection of data
26	19	Thu.	Mzimba District	Mzuzu	(D): site survey
			Lilongwe	Lilongwe	Takaku, Yamagai (E): collection of data
			Lilongwe (17.50) to → KL564	Aircraft	Takamatsu: transfer
27	20	Fri.	Mzimba District	Mzuzu	(D): site survey
			Lilongwe	Lilongwe	(E): Investigation of borehole and work shop constructions-related materials, collection of data
			→ Amsterdam (06.00). Amsterdam (19.30) to → JL412	Aircraft	Takamatsu: transfer
28	21	Sat.	Mzimba District	Mzuzu	(D): site survey
			Lilongwe	Lilongwe	(E): Investigation of borehole and work shop constructions-related materials, collection of data
			→ Narita (14.00)	–	Takamatsu: return to Japan
29	22	Sun.	Mzimba District	Mzuzu	(D): site survey
			Lilongwe	Lilongwe	(E): arrangement of data
30	23	Mon.	Mzimba District	Mzuzu	(D): site survey
			Lilongwe	Lilongwe	(E): Investigation of borehole and work shop constructions-related materials, collection of data
31	24	Tue.	Mzuzu to Lilongwe	Lilongwe	(D): transfer
			Lilongwe	Lilongwe	(E): Investigation of borehole and work shop constructions-related material, collection of data

No.	Date	Day	Movement	Accommo-dation	Activities
32	25	Wed.	Lilongwe to Mchiniji to Lilongwe	Lilongwe	Matsuhashi: site survey
			Lilongwe	Lilongwe	Arrangement of survey and investigation results, discussion of borehole construction plan
33	26	Thu.	Lilongwe	Lilongwe	Discussion of borehole construction plan, final consultation with Ministry of Irrigation and Water Development
34	27	Fri.	Lilongwe	Lilongwe	Report to JICA office, arrangement of survey and investigation results
35	28	Sat.	Lilongwe	Lilongwe	Preparation for return to Japan
36	29	Sun.	Lilongwe (09.30) to Lusaka (11.10) QM181	Lusaka	Takaku, Matsuhashi, Yamagai, Hosooka (F): transfer
			Lilongwe	Lilongwe	Shibata (G): Collection of supplemental data
37	30	Mon.	Lusaka	Lusaka	(F): Report to the Japanese Embassy in Zambia
			Lilongwe	Lilongwe	(G): Collection of supplemental data
38	Oct. 1	Tue.	Lusaka (19.05) to → BA052	Aircraft	(F): Transfer
			Lilongwe (17.50) to → KL564	Aircraft	(G): Transfer
39	2	Wed.	→ London (06.15). London (19.45) to → JL402	Aircraft	(F): Transfer
			→Amsterdam (06.00) Amsterdam (1930) to → JL412	Aircraft	(G): Transfer
40	3	Thu.	Narita (15.25)		(F): Return to Japan
			Narita (14.00)	–	(G): Return to Japan

Appendix-2-(2) Itinerary of the Explanation for the Draft Basic Design

No.	Date	Day	Movement	Accommo-dation	Activities
1	Oct. 30	Wed.	Narita (12:30)→Amsterdam (16:45) JL411 Amsterdam (23:40) → KL563	Aircraft	Departure of team leader and Sugano and consultants (Takaku, Matsuhashi)
2	31	Thu.	→ Lilongwe (12:10)	Lilongwe	PM: Meeting at JICA office
3	Nov. 1	Fri.	Lilongwe	Lilongwe	AM: Courtesy call on Ministry of Finance, Ministry of Irrigation and Water Development and Ministry of Economic Planning and Development PM: Explanation on draft report (Department of Water, Ministry of Irrigation and Water Development)
4	Nov. 2	Sat.	Lilongwe	Lilongwe	Team meeting and collection of data
5	Nov. 3	Sun.	Lilongwe	Lilongwe	Team meeting and collection of data
6	Nov. 4	Mon.	Lilongwe	Lilongwe	Discussion on draft report and minutes
7	Nov. 5	Tue.	Lilongwe	Lilongwe	Discussion on minutes, signing of minutes
8	Nov. 6	Wed.	Lilongwe	Lilongwe	Report to JICA office, collection of data
			Lilongwe (16:15) → Lusaka (17:30) OQ1506	Lusaka	PM: Team leader and Sugano: Transfer to Zambia
9	Nov. 7	Thu.	Lilongwe	Lilongwe	Collection of data
10	Nov. 8	Fri.	Lilongwe	Lilongwe	Collection of data
11	Nov. 9	Sat.	Lilongwe (19:30) → BA044	Aircraft	Transfer
12	Nov. 10	Sun.	→ London (05:55) London (19:00) → JL402	Aircraft	Transfer
13	Nov. 11	Mon.	→ Narita (15:40)	–	Return to Japan

Appendix 3 List of Party Concerned in the Recipient Country

Appendix 3 List of Party Concerned in the Recipient Country

(1) Malawi Officials

1) Ministry of Finance

Dr. N. Banda	Principal Secretary
Mr. J. C. T. Nthani	Deputy Secretary
Mr. J. M. Mhango	Senior Assistant Secretary

2) Ministry of Economic Planning and Development

Mr. G. S. Z. Jere	Deputy Chief Economist and Director of Development Cooperation and SADC Affairs

3) Ministry of Irrigation and Water Development

Mr. K. Manjolo	Principal Secretary
Mr. C. Katete	Principal Accountant
Mr. C. Ngoma	Senior Assistant Accountant

4) Department of Water, Ministry of Irrigation and Water Development

[Head Quarter]

Mr. D. Kankhulungo	Acting Controller of Water Services
Mr. C. Govati	Acting Deputy Controller - Water Resources

(Ground Water Section)

Mr. P. Mtembezeka	Senior Hydrogeologist
Ms. M. Banda	Hydrogeologist
Mr. K. G. Liyanage	Mechanical Engineer
Ms. L. Mpanje	Acting Program Manager (CBM)
Mr. H. Khoviwa	Chief Driller
Mr. Sanila	Senior Driller
Mr. H. Muhezuwa	Senior Borehole Maintenance Officer

(Surface Water Section)

Mr. P. W. Kaluwa	Senior Hydrologist

(Water Supply Branch)

Mr. J. Kumwenda	Principal Civil Engineer

[Regional Office]

Mr. W. P. C. Chitepa	Principal Water Officer (North)
Mr. J. Banda	Regional Hydrogeologist (North)
Mr. K. Good-Come Chisi	Urban Water Supply, Mzimba Maintenance Office
Mr. F. Devisoni	Principal Water Officer (Central)
Mr. R. Msiska	Hydrogeologist (Central)
Mr. J. Mbamdo	Mechanical Engineer (Central)

5) Mzimba District

Mr. W. C. Ngwira	District Commissioner

6) Ministry of Health

Mr. C. J. Kamanga	Principal Statistician, Community Health Service Unit.
Mr. K. Nindi	Control of Diarrhoeal Diseases, Program Manager
Ms. N. G. Mnyenyembe	Regional Nurcy Officer (North)
Mr. L. Chiimfa	Environ. Health Officer, Mzimba Dist. Hospital

7) Ministry of Works

Mr. S. G. Shaba	Chief Road Supervisor (Regional Office (N))
Mr. W. A. C. Mphoka	District Works Coordinator (Mzimba Dist. Office)

8) Ministry of Agriculture

Mr. W. W. Ndovi	Senior Agricultural Officer (Mzuzu ADD)
Mr. R. C. Luhana	Senior Field Officer (Mzuzu ADD)

9) Ministry of Education

Mr. A. M. S. Chirwa	Senior Education Advisor (Regional Office (N))

10) Ministry of Forest

Mr. V. Msiska	Acting Regional Forestry Officer (N)

11) Statistics Office (EP&D)

Mr. Kachingwe	Regional Officer (N)

12) Meteorological Department, Lilongwe International Airport

Mr. P. Jiva	Senior Meteorologist

(2) International Organizations and Others

1) UNICEF

Mr. D. Palm	Deputy Representative, UNICEF Malawi
Mr. R. D. Kafundu	Head of Water and Sanitation Programme
Ms. L. Milazi	Project Office, Water and Sanitation
Mr. C. K. Zulu	Assistant Project Officer, Water and Sanitation

2) The Save the Children Fund (UK)

Mr. T. McCaughan	Field Director
Mr. C. Changaya	Water Programme Manager

3) Africare

Mr. A. Barnes	Country Representative

4) TELECOMMS (Mzuzu Bureau)

Mr. M. B. Nyirenda	Chief Assistant Engineer

5) ESCOM (Electrical Supply Commission of Malawi (Mzuzu))

Mr. Mwvale	Planning Engineer

6) Northern Region Water Board

Mr. D. C. Chirwa	Mzimba Treatment Works, Mzimba Plant
Mr. H. F. L. Nkhosi	Mzimba Treatment Works, Mzimba Plant

Appendix 4 Minutes of Discussion

M-1 Minutes of Discussion (Basic Design Study)

M-2 Minutes of Discussion (Draft Report Explanation)

Appendix 4

M－1(1) Minutes of Discussion (Basic Design Study)

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON
RURAL WATER SUPPLY PROJECT IN WEST OF MZIMBA DISTRICT IN
THE REPUBLIC OF MALAWI

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

JICA sent to Malawi a study team (hereinafter referred to as "the Team"), which is headed by Mr. Yasuo MUKAI, Development Specialist, Institute for International Cooperation, JICA, and is scheduled to stay in the country from August 27 to October 1st, 1996.

The Team held discussions with the officials concerned of the Government of Malawi and conducted a field survey in the study area.

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

Lilongwe, September 3rd, 1996

Mr. Yasuo MUKAI
Leader,
Basic Design Study Team,
JICA

Mr. K. MANJOLO
Principal Secretary,
Ministry of Irrigation
and Water Development

Mr. J. C. T. NTHANI
Deputy Secretary,
Ministry of Finance

ATTACHMENT

1. Objective

The objectives of the Project is to improve the living standard of villagers by establishment of potable water supply.

2. Project Site

The sites of the Project are located in west of Mzimba District in Northern Region. (Site map is attached as Annex I)

3. Executing agency

The Ministry of Irrigation and Water Development is responsible for the administration of the Project, and the Department of Water is responsible for the execution of the Project (organization chart is attached as Annex II).

4. Items requested by the Government of Malawi

After discussions with the Team, the following items were requested by the Malawian side.

(1) Construction of 300 water supply facilities in the communities listed in Annex III.

(2) Construction of operation and maintenance work-shop in Project area.

(3) Procurement of equipment and materials necessary for the construction of 300 boreholes, which is listed in Annex IV.

(4) The Malawian side requested that during the implementation stage, training of users on maintenance and management should be carried out. After the completion of the Project, the Malawian side shall take over all responsibility.

5. Japan's Grant Aid System

(1) The Government of Malawi has understood the system of the Japan's Grant Aid explained by the Team, as described in Annex V.

(2) The Government of Malawi will take the necessary measures, described in Annex VI, for the smooth implementation of the Project on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

6. Schedule of the Study

(1) The consultants will proceed with further studies in Malawi until October 1st in 1996.

(2) JICA will prepare the draft report in English and dispatch a mission in order to explain its contents around November, 1996.

(3) In case that the contents of the report is accepted in principle by the Malawian side. JICA will complete the final report and send it to the Government of Malawi by February, 1997.

7. Other relevant issues

(1) Both sides confirmed that the Malawian Government shall investigate and ensure accessibility to all drilling sites in the Project area. The inaccessible villages, due to unfavorable road condition, will be excluded from the target of borehole construction. A list of accessible and inaccessible villages shall be submitted to the draft report mission to Malawi.

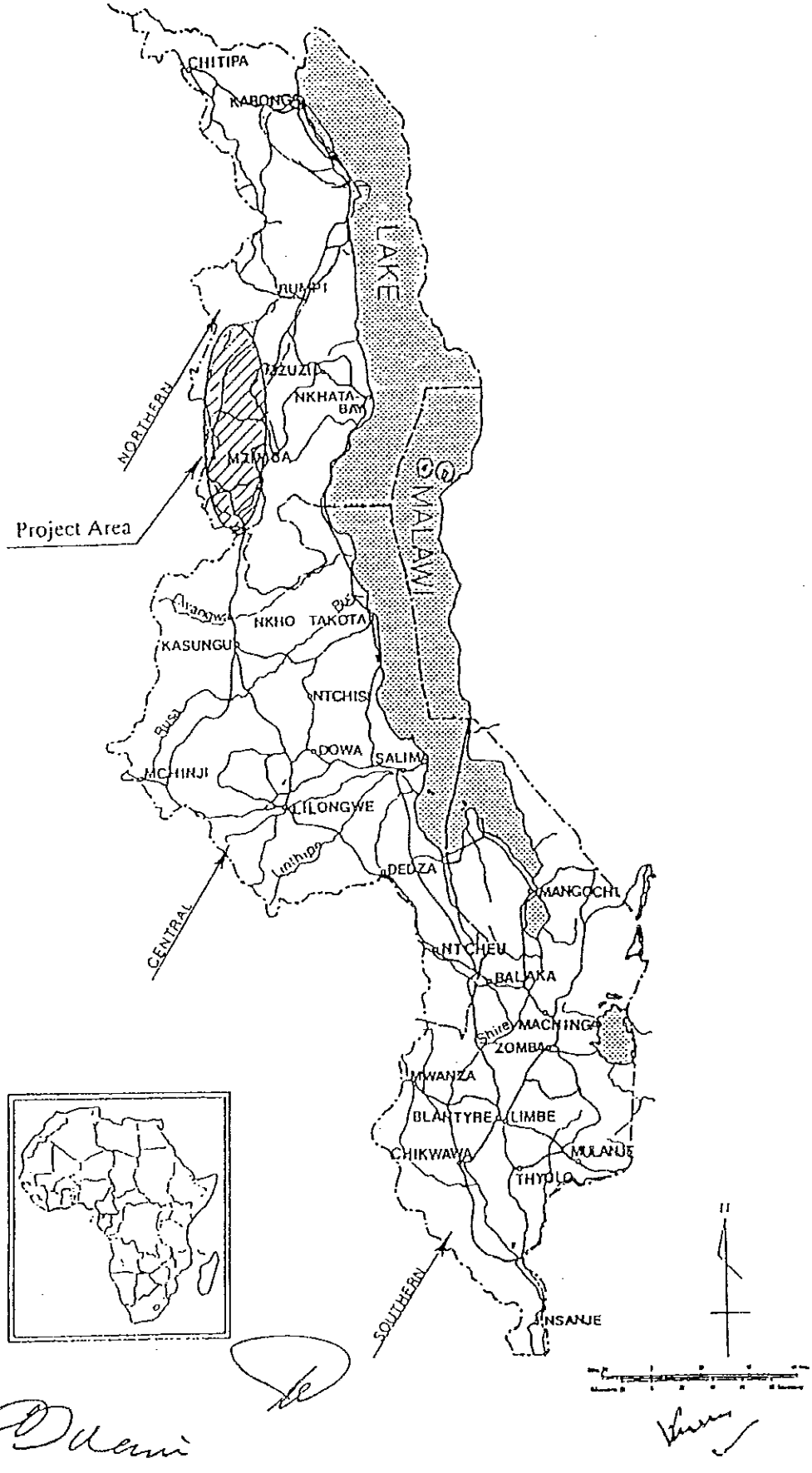
(2) The Malawian side agreed that drilling machines and relevant equipment procured for the North Kawinga and Mchinji projects shall be provided. One machine procured for the North Kawinga project shall be used at least one year and the machine procured for the Mchinji project shall be used for the whole project period.

(3) Both sides agreed that the Malawian side will investigate together with the Basic Design Study Team the following items at the requested villages of the borehole construction at the time of the field survey. The Japanese side in consultation with the Malawian side will decide the final targeted villages of the borehole construction based on the result of the investigation.

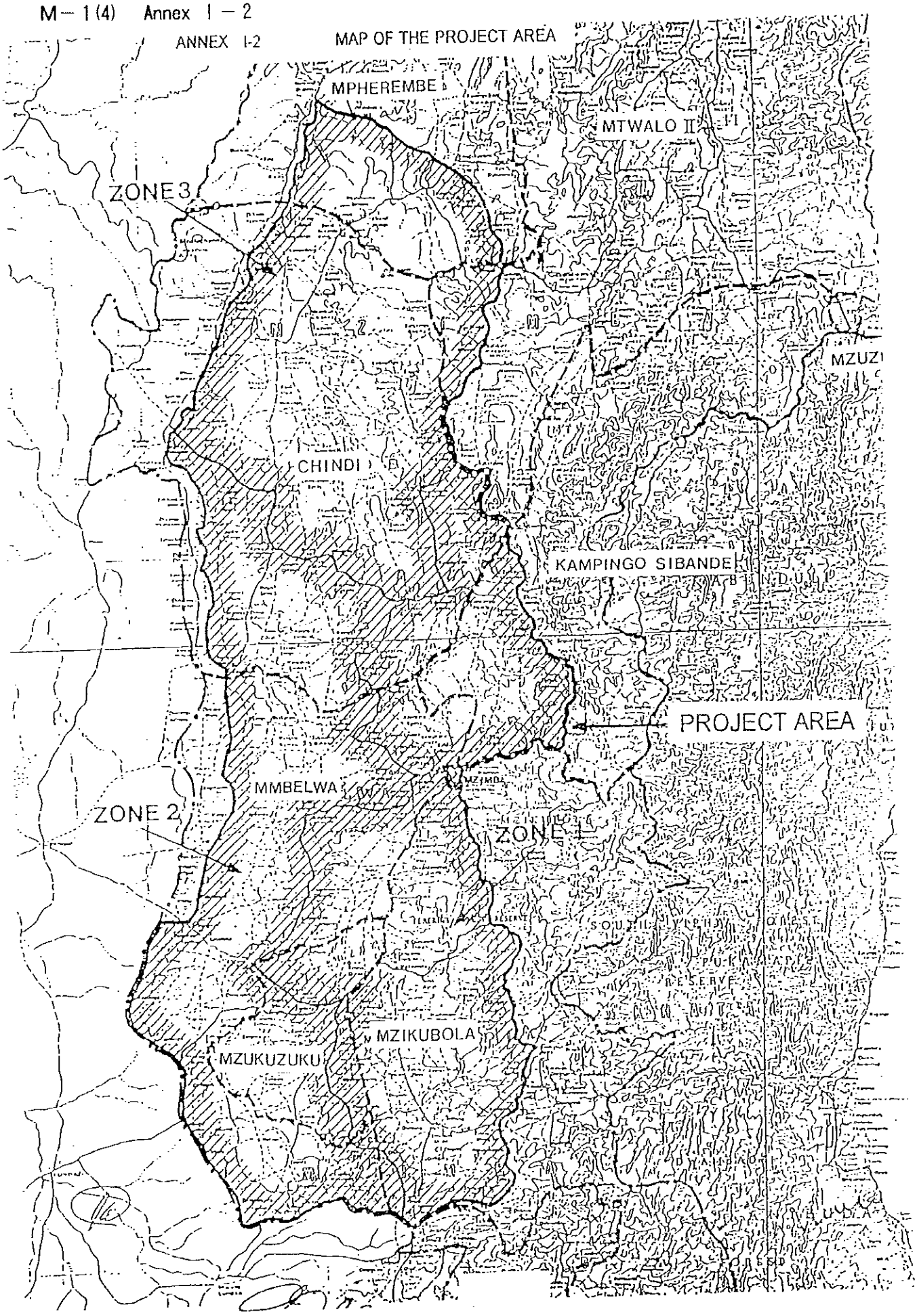
a) Willingness of the communities to manage maintenance of their boreholes, i.e. to form water management committee, to be trained on maintenance of boreholes, to raise funds, to purchase spair parts and to carry out preventive maintenance and repairs.

b) The actual situation of shortage of clean water necessary for life in consideration of the Malawian standard.

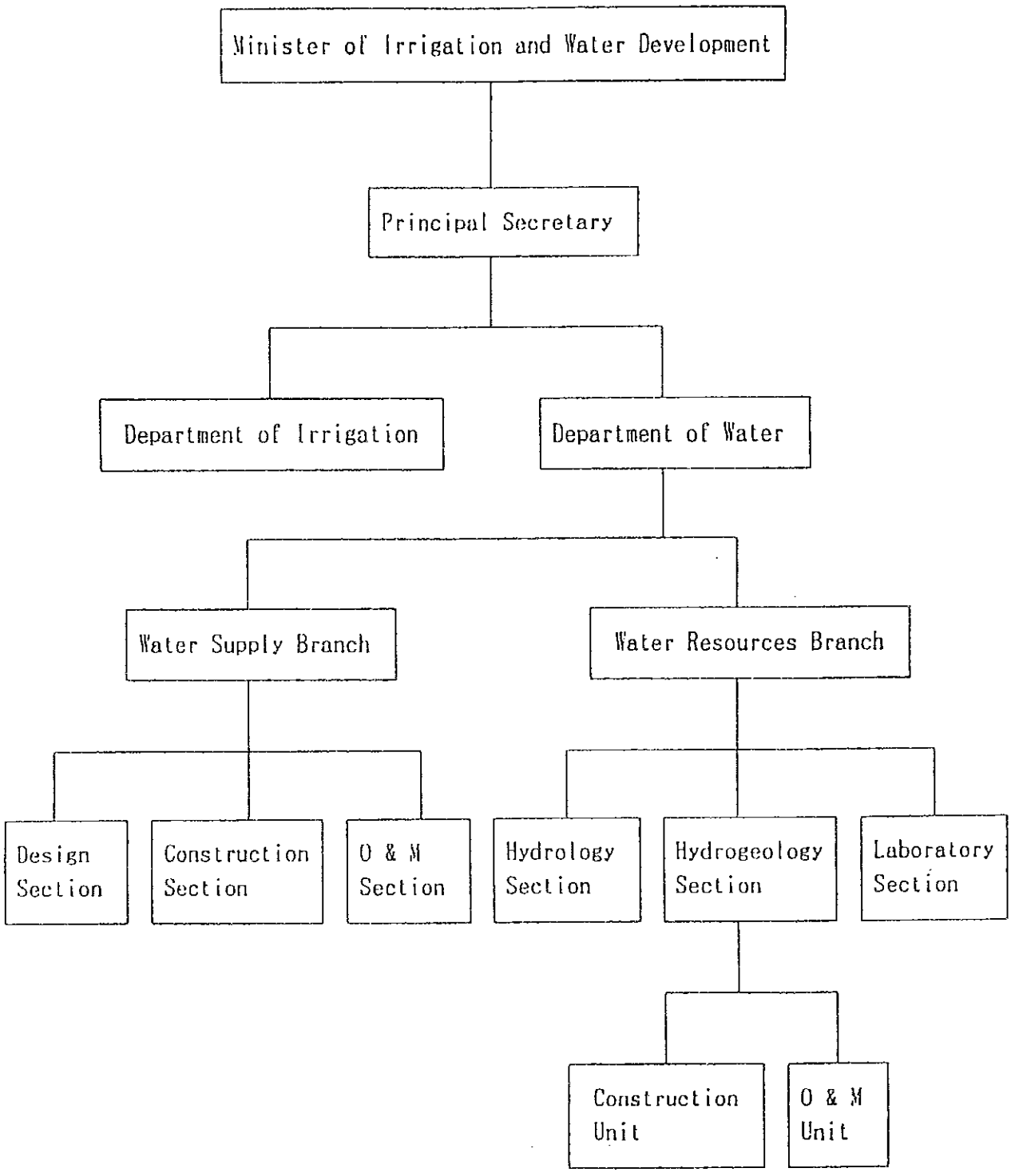
ANNEX I-1　　LOCATION MAP



ANNEX I-2 MAP OF THE PROJECT AREA



ANNEX II Organization Chart of the Ministry of Irrigation and Water Development



ANNEX III List of Villages

1 Ngoli School
2 Samuel Moyo
3 Munyehere Chipeta
4 Kandodo Chisi
5 Mtambalika Moyo
6 Mzimba Boma
7 Mbongo Mwanza
8 Jeremia Mahope
9 Peter Ndaba X2
10 Bokosi Dindi
11 Mirara School
12 Chaeles Chinula
13 Kafoteka Mkandawire
14 Yesaya Shumba
15 Chimombo Matimba
16 Yohane Chisi
17 Samuel Shumba
18 Emazwani School
19 Chisusu Nyirenda
20 Dolora Ngwira
21 kazithole Ziba
22 Tikatika Lungu
23 George Chelinbda
24 Magogi Nyirenda
25 Kanyeru Kadewa
26 Chirombo Jere
27 Nthumba School
28 Hannock Ng'oma
29 Eneya Kumwenda
30 Kamangadazi
31 Samuel Makwakwa
32 Thunduwike School
33 Chivwera Mzumara
34 Thembai Mkandawire
35 Emchisweni School
36 Simon Jere
37 Chidyake
38 Kahalayi
39 James Jere
40 Manolo
41 Thomas Mkandawire
42 Chibula Nguluibe
43 Mpocha Mtonga
44 Vakaza Banda
45 Mtuzu School
46 Kaphokoto Mwandira
47 Malanga Mtonga
48 Kamalibwe School
49 Mabanga Mtonga
50 Kachinjere Nyirongo
51 Mhfafuta School
52 Malembo School
53 Kapopo Market
54 Mdima Mwandira
55 Chisenga Chipeta
56 Malayi Phili
57 Chafisi
58 Kaluwe School
59 Gwanda Banda
60 Hannock Hlanga
61 Mzilikazai
62 Mavunguti Zimba
63 Samuel Kanga
64 Chikondawanga Lusale
65 Mulupani Nyasulu
66 Robert Mwanda
67 Simon Musafire Jere
68 Gongo Mkhata
69 Kamata
70 Eheleni
71 Mtusani Jere
72 Chimuri Nyirenda
73 Kamatabu School
74 Zheze Chisi
75 Manyalu Banda
76 Jenda
77 Siza Longo
78 Zebediya Jere
79 Machilika Nyirenda
80 Kamatadu Village
81 Kanthudu Kanyinji
82 Magaga Sezi
83 Chisinga Nkhoswe
84 Luviri School
85 Machowani Nkhoswe
86 Emchakeni School
87 Echingo Dhleni
88 David Kumwenda
89 Fimbo Moyo
90 Zilahle Mphande
91 Isaac Ngoyi
92 Mapanjira School
93 Chinjoka Nyirenda
94 Chigurere Qutoto
95 Yakobe Soko
96 Bwanari Nkhalipi
97 Zeleza Moyo
98 Chikoweni Nyirenda
99 Matemanga Chikombola
100 Muswamphira Muzwa

101 Thoza School
102 Mzoma Mithi
103 Chizumba Nguluwe
104 Simon Gondwe
105 Nambambe Gausi
106 Tesaya Nkosi
107 Bauleni Sibande
108 Chibembe School
109 Ng'ombeyavuka Kamanga
110 Chipata Moto
111 Zebedia Zighili
112 Mthapagwa Lungu
113 Mbwiriwiza School
114 Edingeni School
115 Gonani Ngwira
116 Ndembara Ngwira
117 Tadeyo Chikwira
118 Bokala School
119 Samuel Mapaso
120 Patamo Kamanga
121 Kadozo Mungutha
122 Sauloai Tembo
123 Mphongo School
124 Kasoti Phiri
125 Mzondi Ndhlovu
126 David Mumba
127 Galela Shaba
128 Hezeka Mwanza
129 Chanunkha Shawa
130 Edingeni
131 Daulire Moyo
132 Mpeyana Gondwe
133 Malinyete School
134 Kaudi School
135 Malangazi School
136 Visenthe School
137 David Sibande
138 Ching'aya School
139 Mzalangwe
140 Eswazini
141 Kapoli School
142 Zebron Kamanga
143 Mbelwa Inst.
144 Kampingo Nyambose
145 Nthumba Admarc
146 Mabuka Hlongo
147 Rufunkunika
148 Stephano Mwanza
149 Sasa School
150 Kavululanga School
151 Matambo Ngulube
152 Kabuku Phiri
153 Paulosi Nthara
154 Njebwa II
155 Mtezi Miti
156 Bichi Mumba
157 Mpanga Visoti
158 Njoka School
159 Chisasa Village
160 Chisasa Agriculture
161 Mpeni School
162 Daniel Tembo
163 Chimbwangandu
164 Egalaweni
165 Njinge Agriculture
166 Nthondanjala Nyirenda
167 Njinge School
168 Chuya School
169 Maloza Zimba
170 Chibuwu Kumwenda
171 Kalweya
172 Mtolabota
173 Dickson Sakala
174 Thomasi Nyirenda
175 Yotamu Ng'oma
176 Zuwayumo Makamo
177 Mateyo Ng'oma
178 Manyamula school
179 Manyamula Agriculture
180 Zebedia Nyirenda
181 Chibeku Ngulube
182 Chikonda Jonasi
183 Chimutu
184 Phazima
185 Kamutepa
186 Vibangalala school
187 Inkosi Mbelwa
188 Katambalala
189 Handle Ndhlovu I
190 Handle Ndhlovu II
191 Mharaunda
192 Ndabambe Gausi
193 Malidadi Jere 2
194 Chimsebezo Banda
195 Katondo
196 Njebwa I
197 Mbawa Admarc
198 Mbawa School
199 Kholowani Lungu
200 Etcheyeni school

201 kalungulu school
202 Kambokoto
203 Mzoma School
204 Bongoya Msimuko
205 Mhawi
206 Malepa Manda
207 Dimi School
208 Mphosa Village
209 Foster Jere
210 Embangweni Mission
211 Embangweni Trading
212 Wilson Jere
213 Kapoli Mtonga
214 Kasich Mvula
215 Isaac Lukhanda
216 Chilomba
217 Matekenya Jere
218 Embangweni Village
219 Embangweni Hqs
220 Vibangalala
221 Baleni Jere
222 Mapupo
223 Mabiri School
224 Swaswa School
225 Mlabamanda
226 Kabinga Banda
227 Eliakimo Mwandira
228 Mpezeni Msimuko
229 Makosikasi School
230 Timothy Mphaka
231 Kapinyuka Village
232 Qolocha Tempo
233 Kamteteka School
234 Daniel Mughogho
235 Chisebe Village
236 Kamteteka Admarc
237 Wajingo Theu
238 Mungoni Wambabvi
239 Chizungu School
240 Chizungu Village
241 Kholwani

ANNEX IV

List of Equipment and Materials Required for the Project.

Items	Quantity
1. Equipment and materials for borehole construction	
a). Rotary drilling machine (Truck mounted, Top-drive type)	1 set
b). Air compressor (Truck mounted)	1 set
c). Casing with Screen (PVC, Φ=110mm, class 10),	for 300 boreholes
d). Muddy water agent and blowing agent	for 300 boreholes
2. Testing equipment	
a). Electric prospecting equipment	1 set
b). Pumping test equipment (Truck mounted)	1 set
c). Electric logging equipment	1 set
3. Supporting Vehicles	
a). Pick-up (Single cabin)	2 sets
b). Pick-up (Double cabin)	2 sets
c). 8t Truck (with 3t crane)	2 sets
d). Motorcycle (125cc)	4 sets
4. Hand pump (Afridev type H=45m)	300 sets
5. Water Tank ($4m^3$)	1 set
6. Fuel Tank ($4m^3$)	3 sets
7. Radio communication equipment	1 set

8. Workshop facilities with repair equipment

a). House construction	1 No.
b). Welding machine	1 set
c). Bench vice and clamping tools	2 sets
d). Torque wrenches	2 sets
e). Filing tools	4 sets
f). Dieing tools	2 sets
g). Others	1 lot

9. Spare parts for existing drilling machines to be used for the Project — 2 sets

ANNEX V

Japan's Grant Aid Scheme

1. Grant Aid Procedures

1) Japan 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 appraise 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 result are then submitted to the Cabinet for approval.

Fourthly, the Project, once approved by the Cabinet, 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, conducted by JICA on a requested project is to provide 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 the 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 jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations in the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For the smooth implementation of the study, JICA uses (a) registered consultant firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out the 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 needed to procure the facilities, equipments and services (engineering services and transportation of the products etc.) for economic and social development the country under the principals 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, ext., are confirmed.

3) "The period of the Grant" means the one fiscal year in which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of 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 Government.

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

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

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

5) Necessity of "Verification"

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

6) Undertakings required of the Government of 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 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.
(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 the necessary staff for operation and maintenance of them 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 shall 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.

ANNEX VI

Necessary measures to be taken by the Republic of Malawi
in case Japan's Grant Aid is extended to the Project.

1. To secure the sites for the Project
2. To provide date and information necessary for the Project.
3. To clear, level and reclaim the borehole and workshop sites prior to commencement of the construction.
4. To undertake incidental outdoor works such as fencing and, gates around the borehole site.
5. To construct the access road to the borehole and workshop sites prior to commencement of the construction.
6. To provide facilities for distribution of electricity, water supply, telephone, drainage, sewage and other incidental facilities to the workshop site.
7. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the Banking Arrangement.
8. To exempt taxes and to take necessary measures for customs clearance of materials and equipment brought for the Project at the port of disembarkation.
9. To ensure prompt unloading and customs clearance at a port of disembarkation in Malawi and facilitate internal transportation therein of the products purchased under the Grant.
10. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the Verified Contract, such facilities as may be necessary for their entry into Malawi 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 Malawi with respect to the supply of the products and services under the Verified Contract.
12. To maintain and use properly and effectively the equipment and materials purchased under the Grant.
13. To bear all the expenses other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and the installation of the equipment.
14. To assign the necessary staff and secure the necessary budget for operation and maintenance of the equipment purchased under the Grant.
15. To maintain the control of tools and spare parts purchased under the Grant.
16. To purchase necessary spare parts by Malawi's own budget after completion of the Project and to execute periodical overhaul.

MINUTES OF DISCUSSIONS
BASIC DESIGN STUDY ON RURAL WATER SUPPLY PROJECT IN WEST OF MZIMBA DISTRICT IN THE REPUBLIC OF MALAWI
(CONSULTATION ON DRAFT REPORT)

In August to October,1996,the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study team on Rural Water Supply Project in West of Mzimba District (hereinafter referred to as "the Project") to the Republic of Malawi , and through discussions, field survey, and technical examination of the results in Japan,has prepared the draft report of the study.

In order to explain and to consult the Malawi side on the components of the draft report, JICA sent to Malawi a study team, which is headed by Mr.Yasuo Mukai, Development Specialist, Institute for International Cooperation, JICA, and is scheduled to stay in the country from October 31st to November 9th, 1996.

In the course of the discussions, both parties have confirmed the main items described in the attached sheet.

Lilongwe, November 5th, 1996

Mr.Yasuo MUKAI
Leader
Draft Report Explanation Team,
JICA.

Mr.K.MANJOLO
Principal Secretary,
Ministry of Irrigation
and Water Development

Mr.J.C.T. NTHANI
Deputy Secretary,
Ministry of Finance

ATTACHMENT

1. Components of the Draft Report

The Government of Malawi has agreed and accepted in principle the components of the draft report proposed by the team.

2. Japan's Grant Aid System

(1)The Government of Malawi has understood the system of the Japanese Grant Aid explained by the team,as described in Annex I.

(2)The Government of Malawi will take the necessary measures, described in Annex II, for smooth implementation of the Project on condition that the Grant Aid Assistance by the Government of Japan is extended to the Project.

3. Further Schedule

(1)The consultant will proceed with further studies in Malawi until November 9th,1996.

(2)The team will make the final report in accordance with the confirmed items, and send it to the Government of Malawi by the end of February, 1997.

4.Other Relevant Issues

(1)The Government of Malawi has agreed to secure necessary budget for the Community Based Management (CBM) activities appropriating the Japanese counterparts funds (KR 1 and KR 2).

(2)The Government of Malawi has agreed to finish the CBM activities,financed by the above-mentioned funds,necessary for the operation and maintenance of each borehole to be constructed before handing over.

ANNEX I

Japan's Grant Aid Scheme

1. Grant Aid Procedures

1) Japan 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 appraise 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 result are then submitted to the Cabinet for approval.

Fourthly, the Project, once approved by the Cabinet, 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.

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