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1．協議議事録

MINUTES OF DISCUSSIONS
ON THE PREPARATORY STUDY
FOR THE SECOND RURAL WATER SUPPLY PROJECT
IN THE KINGDOM OF SWAZILAND

In response to a request from the Government of the Kingdom of Swaziland (herein after referred to as "Swaziland"), the Government of Japan decided to conduct a Preparatory Study for the Second Rural Water Supply Project in the Kingdom of Swaziland (herein after referred to as "the Second Project") and entrusted the study to the Japan International Cooperation Agency (herein after referred to as "JICA").

JICA sent to the Swaziland the Preparatory Study Team (herein after referred to "the Team"), which is headed by Mr. Yoshiki Omura, Water Supply Development Specialist, Institute for International Cooperation, JICA and is scheduled to stay in the country from November 30 to December 20, 1999.

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

In the course of discussions and field survey, both parties have confirmed the main items described on the attached sheets. Subject to the decision by the Government of Japan, JICA will conduct a Basic Design Study on the Second Project.

Mbabane, December 6, 1999

Yoshiki Omura
Leader,
Preparatory Study Team,
Japan International Cooperation Agency

Absalom V. Mamba
Undersecretary
Ministry of Natural Resources and Energy

ATTACHMENT

1. Project Objective

In coordination with the Rural Water Supply Project completed in 1998 (herein after referred to as "the First Project"), the overall objective of the Second Project is to improve the water supply conditions in the rural areas of Swaziland, which can only be achieved by undertakings of both Swazi and Japanese parties. The objective of the Grant Aid, requested by the Swazi party is to supply safe drinking water to the requested communities.

2. Responsible and Implementing Agencies

(1) Responsible Agency of the Second Project

Ministry of Natural Resources and Energy (as shown in Annex-1.1)

(2) Implementing Agency of the Second Project

Rural Water Supply Branch, Ministry of Natural Resources and Energy (herein after referred to as "RWSB", as shown in Annex-1.2)

3. Items requested by the Government of the Swaziland

The Swazi party finally requested the Japanese party for the construction of facilities and provision of equipment for the Micro and Macro Schemes (defined in Annex-2) of the Second Project as listed below:

(1) Micro Schemes (90 boreholes)
   1) Construction of 45 boreholes and installation of handpumps by Japanese Grant Aid
   2) Construction of 45 boreholes and installation of handpumps by RWSB with provision of materials and supervision by the Japanese party

(2) Water supply facilities (Macro and/or Micro Schemes) for Lomahasha and Majembeni areas

The Swazi party also mentioned that the design criteria of the First Project should be applied in principle to the Second Project.

4. Project Sites

The specific list of the communities with numbers of Micro Schemes that were requested by Swazi party in Item 3 (2) above, are in Annex-3. The Swazi party explained that the requested communities were selected by RWSB referring to the criteria as below:

(1) Scarcity of drinking water and lack of water supply facilities
(2) No request made to the other donors
(3) A water supply and sanitation committee already formed
(4) Necessary operation and maintenance fund raised

The map of the detailed location of the requested communities should be submitted to the Team by December 15, 1999.

5. Japan's Grant Aid system

(1) The Swazi party understood the Japan's Grant Aid Scheme and procedures explained by the Team as shown in Annex-4 and Annex-5.

(2) The Swazi party will take the necessary measures, described in Annex-6, for smooth implementation of the Project, as a condition for the Japanese Grant Aid to be implemented.

6. Schedule of the study

(1) The Team will proceed to further studies in Swaziland until December 20, 1999.

(2) Based on the results of the studies, JICA will prepare a summary of the Preparatory Study Report around February 2000.

7. Other Relevant Issues

(1) After visiting the First and the Second Project sites, the Team suggested to RWSB the following improvements for the First Project:
   1) Fences or protection should be built around the public standpipes.
   2) The surface water treatment facilities should be maintained more properly, such as more frequent cleaning of filter media and draining of accumulated sludge.
   3) Water minders and pump attendants be given brush-up training course on operation and

maintenance, especially where Macro Schemes are operated.

(2) The Team presented its technical view on the requested Second Project as follows:

The Micro Schemes would have minor technical issues as far as groundwater availability is confirmed, while the Macro Scheme would need further engineering studies such as water source availability, selection of treatment technology, water transmission and distribution costs.

The Team, therefore, considered that the proposed Macro Scheme should be carefully studied during the coming Basic Design Study, if the Japanese Government approves, including homestead density and Micro Scheme alternatives.

(3) By December 15, RWSB shall collect necessary data and respond to the Questionnaire submitted to the Swaziland Party by the Team.

(4) RWSB shall make arrangements with the Department of Geological Survey and Mines and other relevant agencies, in order for the Team to obtain necessary data and information, including geological maps and aerial photographs of Swaziland.

(5) RWSB shall prepare necessary data and information, as well as the community list for the requested areas of Lomahasha and Majembeni and submit to the Team by December 15.

(6) RWSB shall submit a design manual for water supply facilities, which is currently being drafted by RWSB. The manual will include design criteria, water quality standards, construction standards, training and education methodology.

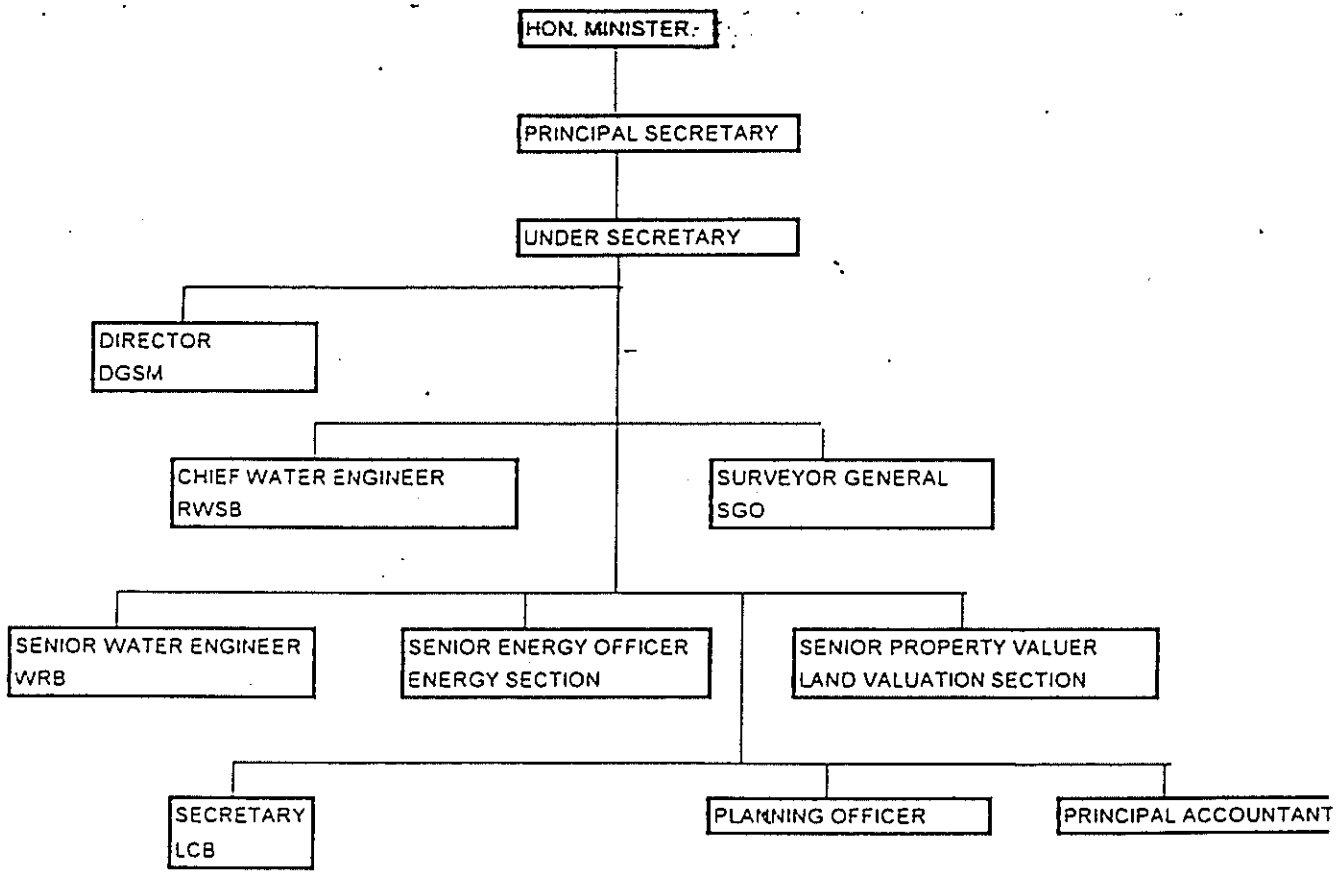
(7) If the Basic Design Study is commenced, RWSB shall provide necessary existing equipment and services for the execution of the Basic Design Study.

(8) If the Second Project is implemented under Japanese Grant Aid, RWSB will execute necessary education and training for the water supply and sanitation committee of target communities.

(9) RWSB will ensure the sustainability of the First Project by continuously monitoring the project communities and providing technical and financial assistance when necessary. If the Second Project is implemented under the Japanese Grant Aid, RWSB will ensure its sustainability as well as the First Project.

(10) In connection with the Second Project, the Swazi party requested for dispatch of two Japanese experts in the field of Geological Survey (short term) and Water Management (long term). Also the Swazi party requested for acceptance of trainees in the field of water resources management and construction engineering. Concerning the request for technical assistance, the Swazi party submitted a request to the Embassy of Japan in South Africa. However the Team will report the above request to the Government of Japan.

Annex-1.1 Organizational Chart of Ministry of Natural Resources, and Energy



WRB - WATER RESOURCES BRANCH
RWSB - RURAL WATER SUPPLY BRANCH
SG0 - SURVEYOR GENERAL'S OFFICE
DGSM - DEPARTMENT OF GELOGICAL SURVEY AND MINES
LCB - LAND CONTROL BOARD

Annex-1.2 Organizational Chart of Rural Water Supply Branch

Annex-2 Definition of the "Micro Scheme" and the "Macro Scheme"

A "Micro Scheme" or a "Macro Scheme" is referred to as a single complete water supply facility, which serves communities of rural areas in Swaziland, with administrative capacity of the beneficiaries concerned. The detailed conditions of the facility in the Micro Scheme and the Macro Scheme are as below.

1. The water supply facility of the Micro Scheme should :
   (1) have not more than 5 standpipes.
   (2) have not more than $15m^3$ of capacity in the distribution reservoir.
   (3) have not more than 2km of pipeline.
   (4) have not more than 50,000 Emalangeni in construction cost.
   (5) be operated by either manpower or gravity only.

2. The water supply facility of the Macro Scheme refers to facilities other than that of the Micro Scheme.

Other than the above Schemes, a number of individual private systems and institutional systems are operated without intervention of RWSB.

Annex-3

Community List for Micro Scheme Year: 1999

Rural Water Supply Project XII - Japanese Project -

	Region	No.	Community	Priority	Population	Homestead	Existing Macro Scheme	Existing Micro Scheme	Requested Micro Scheme	Remarks
1	Hhohho	1	MELETI 1-5	A	2100	210	0	1	5	
2	Hhohho	2	NDZINGENI	A	2500	250	0	0	5	
3	Hhohho	3	LUHLANGOTSINI	A	3000	300	1	1	6	
4	Hhohho	4	MAWONBE	A	1800	180	0	0	7	
			Total		9400	940	1	2	23	

Community List for Micro Scheme Year: 1999
Rural Water Supply Project XII - Japanese Project -

	Region	No.	Community	Priority	Population	Homestead	Existing Macro Scheme	Existing Micro Scheme	Requested Micro Scheme	Remarks
6	Lubombo	1	SIJEJELE	A	700	70	0	0	1	
7	Lubombo	2	ENTANDWENI	A	900	90	0	1	1	
8	Lubombo	3	ELAWINI	A	700	70	0	1	1	
9	Lubombo	4	ESIKHONKHWANENI	A	1000	100	0	1	1	
10	Lubombo	5	MANTJOLINI	A	600	60	0	1	1	
11	Lubombo	6	MADADENI	A	700	70	0	0	1	
12	Lubombo	7	ETIPOKWENI	A	600	60	0	1	1	
13	Lubombo	8	MPHANGANYETI	A	700	70	0	1	1	
14	Lubombo	9	THUTHUKA	A	1200	120	0	2	1	
15	Lubombo	10	SIGCAWENI/NHLANTIMBITHA	A	900	90	0	2	1	
16	Lubombo	11	MAPHUNGWANE/ESIBOVINI	A	600	60	0	1	1	
17	Lubombo	12	MCONCWANE/NTANDANE	A	600	60	0	1	1	
18	Lubombo	13	MBOLOLWENI	A	700	70	0	1	1	
19	Lubombo	14	HLANE	A	1500	150	0	0	2	
20	Lubombo	15	MACUMANENI	A	1500	150	0	3	2	
21	Lubombo	16	MDUMEZULU	A	2000	200	0	3	2	
22	Lubombo	17	MAMISA	A	2000	200	0	4	3	
			Total		16900	1690	0	23	23	

Community List for Micro Scheme Year: 1999
Rural Water Supply Project XII - Japanese Project -

	Region	No.	Community	Priority	Population	Homestead	Existing Macro Scheme	Existing Micro Scheme	Requested Micro Scheme	Remarks
23	Manzini	1	NJAMANE	A	1600	160	0	0	1	
24	Manzini	2	MONENI	A	650	65	0	0	1	
25	Manzini	3	MONENI (EMASEKWENI)	A	860	86	0	0	1	
26	Manzini	4	NDABENI	A	650	65	0	0	1	
27	Manzini	5	OSUTHU (METHODIST)	A	700	70	0	0	1	
28	Manzini	6	NKANGALA	A	830	83	0	0	1	
29	Manzini	7	BHADZENI II	A	1000	100	0	0	1	
30	Manzini	8	MANCUBENI	A	2500	250	0	0	1	
31	Manzini	9	KA NTUNJA	A	830	83	0	0	2	
32	Manzini	10	NTABAMHLOSHANA	A	2500	250	0	0	2	
33	Manzini	11	MPONONO	A	2200	220	0	0	2	
34	Manzini	12	KULESIBOVU	A	1500	150	0	0	4	
35	Manzini	13	EMSENI/MNFANGIBHEKILE	A	3570	357	0	0	5	
			Total		19390	1939	0	0	23	

Community List for Micro Scheme Year: 1999
Rural Water Supply Project XII - Japanese Project -

	Region	No.	Community	Priority	Population	Homestead	Existing Macro Scheme	Existing Micro Scheme	Requested Micro Scheme	Remarks
36	Sheselweni	1	MAMBUZIKAZI	A	100	10	0	0	1	
37	Sheselweni	2	KAJELE	A	200	20	0	0	1	
38	Sheselweni	3	NKEZWANE	A	210	21	0	0	1	
39	Sheselweni	4	DLAYIWYONI	A	150	15	0	0	1	
40	Sheselweni	5	ENKALABUTHAKA	A	210	21	0	0	1	
41	Sheselweni	6	MDUNUSA	A	250	25	0	0	2	
42	Sheselweni	7	NENEKAZI	A	250	25	0	0	2	
43	Sheselweni	8	HLABANGEMEHLO	A	300	30	0	0	2	
44	Sheselweni	9	EMAGANYANENI	A	220	22	0	0	2	
45	Sheselweni	10	DINABANYE	A	500	50	0	0	3	
46	Sheselweni	11	OSABENI	A	300	30	0	0	3	
47	Sheselweni	12	SIBOVINI	A	560	56	0	0	3	
			Total		3250	325	0	0	22	
			Grand-Total		48940	4894	1	25	33	

Annex-4 JAPAN'S GRANT AID PROGRAM

1. Japan's Grant Aid Procedures

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

- Application (request made by a recipient country)
- Study (Preparatory Study / Basic Design Study conducted by JICA)
- Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
- Determination of Implementation (Exchange of Notes between both Governments)
- Implementation (Implementation of the Project)

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

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

Thirdly, the Government of Japan appraises to see whether or not the project 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 when pledged by 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. Contents of the Study

(1) Contents of the Study

The aim of the 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 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

project implementation,

b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economical 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 to Minutes of Discussions.

(2) Selecting (a) Consulting Firm(s)

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

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

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 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. The Grant Aid is not in a form of donation of materials or 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 one Japanese 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) consulting firm(s) and (a) contractor(s) and final payment to them must be completed.

However in case of delays in delivery, installation of 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, 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 may be used for the purchase of products or services of a third country.

However the prime contractors, namely, consulting, contractor 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 the "Verification"
The Government of the 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 tax payers.

(6) Undertakings required to the Government of the recipient country
In the Implementation of the Grant Aid Project, the recipient country is required to undertake necessary measures such as the follows:

a) To secure land necessary for the sites of the project and to clear, level and reclaim the land prior to commencement of the construction work,

b) To provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
c) To secure buildings prior to the installation work in case the Project is providing equipment,
d) 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,
e) 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,
f) 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 works.

(7) "Proper Use"

The recipient country is required to maintain and use 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 expenses other than those to be covered by the Grant Aid.

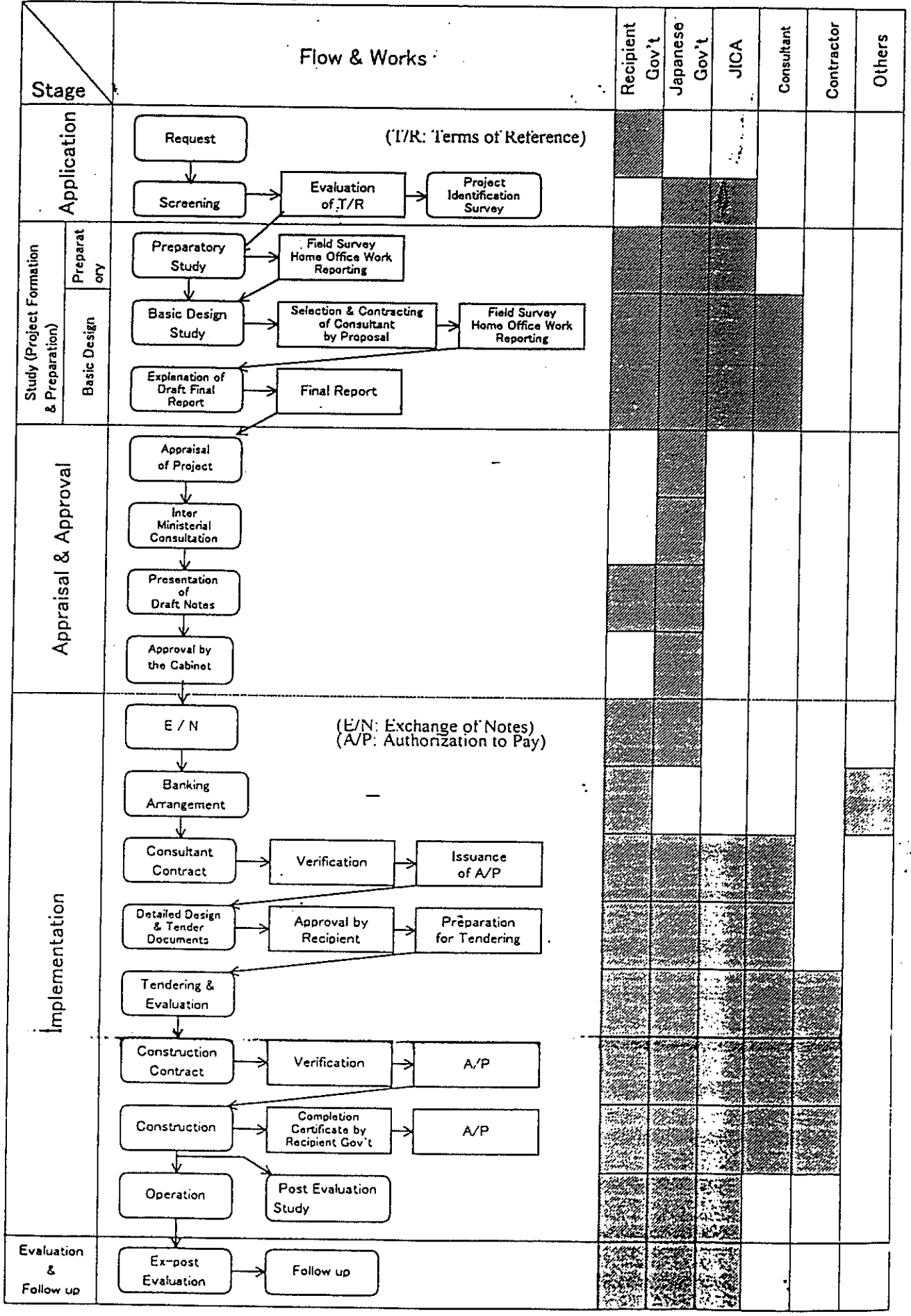
(8) Re-export

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

(9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by 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-5 Flow Chart of Japan's Grant Aid Procedures



Annex-6 Necessary measures to be taken by the Government of the Swaziland on condition that Japan's Grant Aid is extended.

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 work.

2. To bear commissions to the Japanese foreign exchange bank to execute the banking services based upon the banking arrangement.

3. To ensure prompt unloading and customs clearance at port of disembarkation in Swaziland and facilitate internal transportation therein of the products purchased under the Grant.

4. To ensure the customs clearance at the port, inland transportation from the port to each site, and to bear the cost for bonded storage at the port.

5. To exempt Japanese nationals from custom duties, internal taxes and other fiscal levies which may be imposed in Swaziland with respect to the supply of the products and services under the verified contracts. And to take necessary measures for such tax exemption.

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

7. To use and maintain properly and effectively all the equipment purchased and facilities constructed under the Grant.

8. To bear all the expenses other than those covered by the Grant, necessary for the execution of the Project.

9. To provide necessary data and information for the project.

10. To assign exclusive counterpart engineers and technicians for the Project.

2．調査団構成

スワジランド王国第２次地方給水計画予備調査
Preparatory Study on the Project for Rural Water Supply Project, Phase 2
in the Kingdom of Swaziland

１．総括：大村　良樹
国際協力事業団
国際協力総合研修所
国際協力専門員

１．Leader：Yoshiki OMURA
Water Supply Development Specialist,
Institute for International Cooperation,
Japan International Cooperation Agency

２．計画管理：小島　岳晴
国際協力事業団
無償資金協力部準備室
業務第１グループ

２．Project Coordinator：Takeharu KOJIMA
First Project Management Div,
Grant Aid Management Department,
Japan International Cooperation Agency

３．地下水計画／水理地質：
高柳　建二
日本上下水道設計（株）

３．Groundwater Specialist／Hydrogeologist：
Kenji TAKAYANAGI
Nippon Jougesuidou Sekkei Co.,LTD

４．水道計画：
山崎　英氣
北海道開発コンサルタント（株）

４．Water Supply Specialist：
Hideki YAMAZAKI
Hokkaido Engineering Consultants Co.,LTD

3．調査日程

スワジランド国「第２次地方給水計画」予備調査

― 調査日程表 ―

日順	日付 (1999 年)		行程				宿泊地
			大村 (1)	小島 (2)	高柳 (3)	山崎 (4)	
1	11 月 28 日	日	17:45 成田（CX505）→21:45 香港 23:50 (CX749) →				機中泊
2	11 月 29 日	月	→05:40 ﾖﾊﾈｽﾌﾞﾙｸﾞ着 午後：日本大使館, JICA 南ア事務所表敬				ﾌﾟﾚﾄﾘｱ (1) (2) (3) (4)
3	11 月 30 日	火	午前：ﾌﾟﾚﾄﾘｱ→ﾑﾊﾞﾊﾞﾈ（陸路） 午後：地方給水局表敬				ﾑﾊﾞﾊﾞﾈ (1) (2) (3) (4)
4	12 月 1 日	水	午前：天然資源・エネルギー省表敬、地方給水局協議 午後：経済開発省次官表敬、プロジェクトサイト調査				ﾑﾙﾒ (1) (2) (3) (4)
5	12 月 2 日	木	プロジェクトサイト調査				ﾑﾙﾒ (1) (2) (3) (4)
6	12 月 3 日	金	〃				ﾑﾊﾊﾞﾈ (1) (2) (3) (4)
7	12 月 4 日	土	〃				ﾑﾊﾞﾊﾞﾈ (1) (2) (3) (4)
8	12 月 5 日	日	団内会議、ﾐﾆｯﾂの準備				ﾑﾊﾞﾊﾞﾈ (1) (2) (3) (4)
9	12 月 6 日	月	午前：ﾐﾆｯﾂの調印、天然資源・エネルギー省大臣表敬 午後：地方水道局協議及び資料収集				ﾑﾊﾞﾊﾞﾈ (1) (2) (3) (4)
10	12 月 7 日	火	ﾑﾊﾞﾊﾞﾈ→ﾌﾟﾚﾄﾘｱ（陸路）		継続調査 (3)Mankayane 地区調査		ﾌﾟﾚﾄﾘｱ (1) (2) ﾑﾊﾞﾊﾞﾈ (3) (4)
11	12 月 8 日	水	午前：日本大使館, JICA 南ア事務所報告 午後：ﾖﾊﾈｽﾌﾞﾙｸﾞ(CX1748) →12:15 香港		〃 (3)Lavumisa 地区調査		機中泊 (1) (2) ﾑﾊﾞﾊﾞﾈ (3) (4)
12	12 月 9 日	木	香港(CX500)→成田帰着		〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
13	12 月 10 日	金			〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
14	12 月 11 日	土			〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
15	12 月 12 日	日			—		ﾑﾊﾞﾊﾞﾈ (3) (4)
16	12 月 13 日	月			(3)(4)Lomahasha 地区調査		ﾑﾊﾞﾊﾞﾈ (3) (4)
17	12 月 14 日	火			〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
18	12 月 15 日	水			〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
19	12 月 16 日	木			〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
20	12 月 17 日	金			〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
21	12 月 18 日	土			〃		ﾑﾊﾞﾊﾞﾈ (3) (4)
22	12 月 19 日	日			団内会議		ﾑﾊﾞﾊﾞﾈ (3) (4)
23	12 月 20 日	月			午前：ﾑﾊﾞﾊﾞﾈ→ﾌﾟﾚﾄﾘｱ（陸路） 午後：JICA 南ア事務所報告		ﾌﾟﾚﾄﾘｱ (3) (4)
24	12 月 21 日	火			午前：大使館報告 午後：14:15 ﾖﾊﾈｽﾌﾞﾙｸﾞ (SQ405) →		機中泊 (3) (4)
25	12 月 22 日	水			→06:20 ｼﾝｶﾞﾎﾟｰﾙ、8:35 ｼﾝｶﾞﾎﾟｰﾙ (JL712) →15:55 成田帰着		

（注、団員構成、総括：大村、計画管理：小島、地下水計画/水理地質：高柳、水道計画：山崎）

4．主要面談者リスト

— 主要面談者リスト —

(1) 経済計画開発省 (Ministry of Economic Planning & Development)
Mr. Ephraim M. Hlophe, Principal Secretary

(2) 天然資源・エネルギー省(Ministry of Natural Resources and Energy)
Prince Guduza Dlamini, Minister
Mr. Absalom V. Mamba, Undersecretary

(3) 地方給水局 (Rural Water Supply Branch)
Mr. Stephen S. Dlamini, Chief Water Engineer
Mr. Cyril B. Kanya, Design Engineer
Mr. Phillip Gwebu, Project Engineer (Matsapha Workshop)
Mr. Zacharia Machamya, Hydrogeologist Technician (Matsapha Workshop)
Mr. Douglas Maphanga, Assistant Drilling Superintendent (Matsapha Workshop)
Mrs. Zanele Sgwane, Laboratory Technologist (Matsapha Workshop)
Mr. Jahannes Ntuli, Clerk of Works (Lubombo Region)

(4) 地質鉱山局 (Department of Geological Survey and Mines)
Mr. Obed Ngwenya, Hydrogeologist, Groundwater Section

(5) 都市給水公社
Mr. Nicholas Matsebula, Planning Engineer

(5) 在南アフリカ日本国大使館
大塚公使
石倉一等書記官
佐野書記官

(6) JICA 南アフリカ共和国事務所
高橋嘉行事務所長
木藤耕一事務所員

5．協議経過

1999年12月21日

スワジランド国第２次地方給水計画予備調査
コンサルタント団員継続調査報告

高柳 建二（地下水計画/水理地質）
山崎 英氣（水道計画）

（１）継続調査内容

M/D署名交換後、12月７日～19日のコンサルタント団員の現地（スワジランド国）における主な調査内容は次のようである。

(i) ミクロスキーム予定地区の現地踏査（Mankayane地区およびLavumisa地区）
(ii) マクロスキーム予定地区の現地再踏査（取水候補地およびLomahasha町）
(iii) 各種資料および情報の収集
(iv) 要請内容の技術的項目に関しての地方給水局（RWSB）との協議・確認
(v) 入手資料の整理

なお、要請機材については、改定された新リストが提出された（RWSB局長からJICA宛ての書状）ので、調査団員が受領した。

（２）ミクロスキーム

ミクロスキーム（ハンドポンプ付き井戸）の要請対象サイトは、Hhohho県４コミュニティ、Lubombo県17コミュニティ、Manzini県13コミュニティ、Shiselweni県１２コミュニティの合計46コミュニティであり、90ヶ所の給水施設の建設を要請している。要請対象サイトの総人口は、48,940人であって、ハンドポンプにより安全で安定した地下水を、生活用水として得られるようになる。

要請対象サイトの実情をMankayaneとLavumisa地区の５コミュニティで現地調査した。対象コミュニティは散村形態で緩やかな山地斜面や平地に立地し、村人は、約１～５ｋｍ離れた谷川や貯水池の水を、そのまま使用している。そのため、子供の下痢が多いとのことであった。調査サイトのコミュニティ総て村人は公共の給水施設を所有していない。

この90施設の建設は、45ヶ所が日本側により、45ヶ所がRWSBにより、第１次地方給水計画により供与済みのさく井機材及び調査機材を使って建設することになる。供与機材は総てMatsaphaにある中央ワークショップに保管されており、その保管状況は一応のレベルを満たしている。

さく井機械類は総て稼動状況にある。技術移転の結果RWSBはさく井に関して独力

で井戸を完成させる技術を習得しているように判断される。ただし、さらに技術レベルを高めるために、第２次地方給水計画を実施する場合には、第１次同様に建設工事を行う際に、供与機材についての技術移転を引き続いて実施するのが望ましい。RWSB 技術者からさらに技術レベルを高めるために、地下水調査技術に関する専門家派遣を含めて技術移転を行って欲しいとの要望があった。

RWSB によれば、総ての要請サイトには施設建設に先立って維持管理のための水管理委員会が設置され、水管理基金を徴収しているとのことであったが、実際は、設立済み・未設置等さまざまであった。維持管理は極めて重要であるので、RWSB を通じて設立の促進を各コミュニティに指導していく必要がある。

（３）マクロスキーム

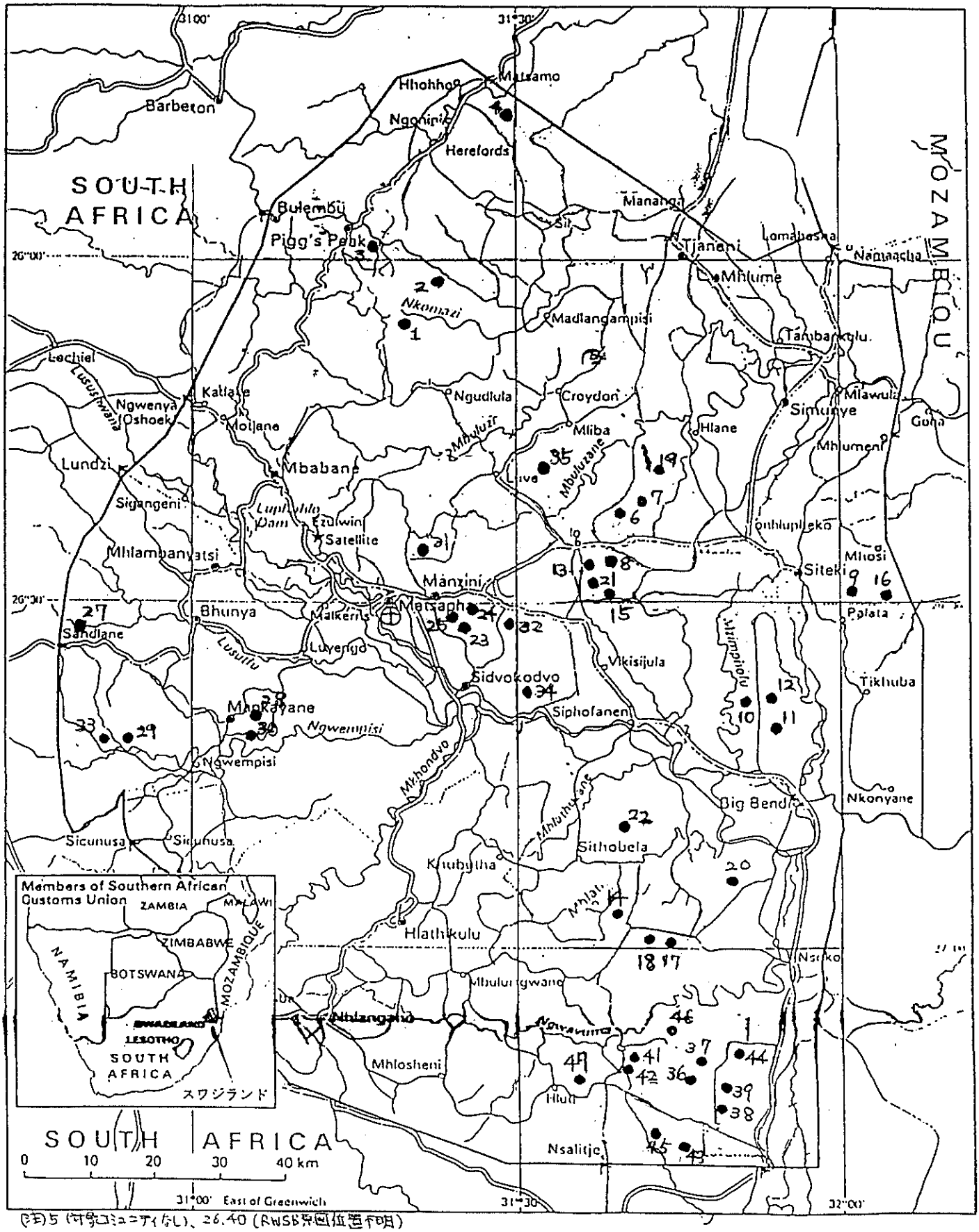
マクロスキーム（パイプラインを有する水道で共用水栓から給水する方式）の対象地域は、当初要請では明確でなかったが、地方給水局（RWSB）と協議を行い、若干の修正を経て最終的に添付図面のようであることを確認した。すなわち、北ルボンボ地域の４地区（(1) Lomahasha, (2) Nkalashane, (3) Shoka, (4) Shewula）で、人口は合計 29,150 人である、水量規模は 1,200 m3/d となる。

課題は水源で、地域内に地下水を開発することが重要である。地質調査鉱山局が過去に地下水調査を実施し、試験井を９本掘っている。RWSB は、この水源開発が有望と期待している。しかしながら、現地調査と揚水試験データの検討結果からは開発可能かどうかは現時点でかなり疑問がある。地域内の地下水取水の可能性については、基本設計（B/D）調査時に詳細調査の上、確定する必要がある。

マクロスキーム必要水量の地下水が１か所（または数か所）で開発できない場合、水源を地域外の表流水（水量充分な Mbuluzi 川）に求めることができるが、コスト（建設費および運転管理費とも）に難があるので、その採択決定には慎重な検討を必要とする。従い、本計画をやむを得ずミクロスキームによる給水方式に転換する可能性も残されている。

（４）要請機材

当初の要請機材リストはおおまかな機材内容を示したものであり、本計画事業実施の主旨に沿わない機材が含まれていたことと、機材名称・内訳が不明のものがあったため、改めて整理・改定された新要請リスト書状が RWSB 局長から JICA 宛てに提出された。（添付書状参照）。



(注)5 (研究コミュニティなし)、26.40 (RWSB界面位置不明)

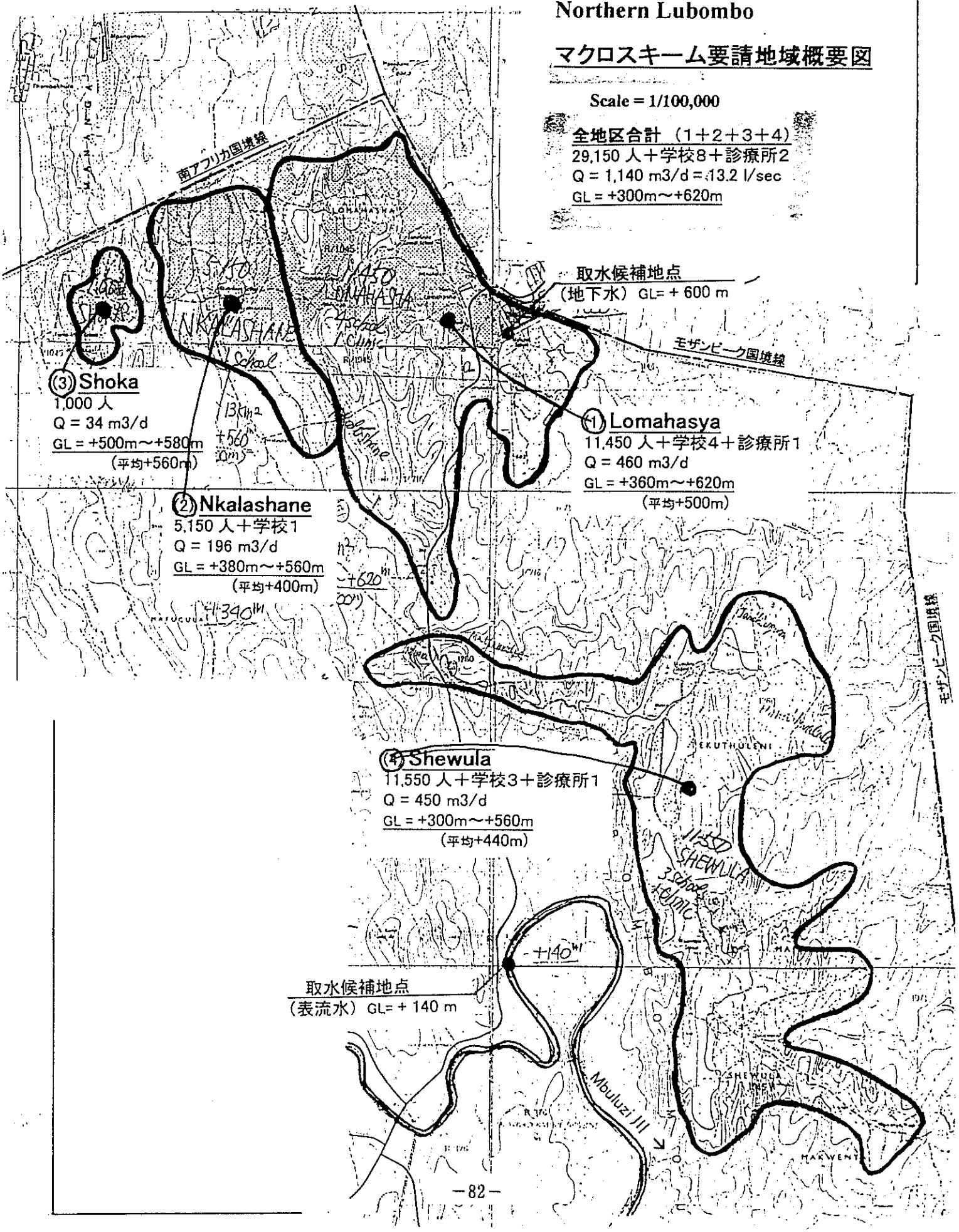
要請サイト（ミクロスキーム）

Northern Lubombo

マクロスキーム要請地域概要図

Scale = 1/100,000

全地区合計 （1＋2＋3＋4）
29,150 人＋学校8＋診療所2
Q = 1,140 m3/d = 13.2 l/sec
GL = +300m～+620m



To:

Japan International Cooperation Agency (JICA)
Shinjuku Maynds Tower Building
6th Floor, 1-1, Yoyogi, 2-Chome
Shibuya-ku, Tokyo, Japan

DETAIS OF REQUESTED EQUIPMENT AND MATERIALS BY RURAL WATER SUPPLY BRANCH

The following is the list of requested equipment and materials :-

1.. Drilling Materials

ITEM	DESCRIPTION	QUANTITY
1.	Drilling rig level indicator	4
2.	15mm wire ropes	50 meters
3.	9mm wire ropes	50 meters
4.	Wire rope pulleys	12
5.	Crane truck alarm clock	4
6.	Half moon drill pipe vibration dampers	12 pairs
7.	Drive spindle subs	10
8.	8 1/2 inches DTH hammers	2
9.	8 ½ inches drilling bits	16
10.	YBM drill rig hydraulic oil filters	8
11.	YBM drill rig hydraulic oil suction filters	8
12.	PDSJ 750S high pressure 300 compressor filters complete	1 lot
13.	Consumable drilling spare parts	1 lot

2. Pump Testing Materials

1. Leadout cable (pump sp5a-17)(50hz-380v-1.5kw)
2. Motto (pump sp8a-18)(50 hz-380v-3.7kw)
3. NA electrode, Cable 100m (2)
4. Control panel with ELB (2)
5. Diesel pump filter (Airman SDG 12S) (4)

3. Borehole Development Materials

1. Well casings, screens and handpumps for 45 boreholes to be constructed by Rural Water Supply Branch

4. Equipment Required for the Construction Work of 45 boreholes

ITEM	DESCRIPTION	QUANTITY
1.	Concrete Mixers	4 (1 per region)

2.	Back hoes	4 (1 per region)

S.S. DLAMINI
CHIEF WATER ENGINEER