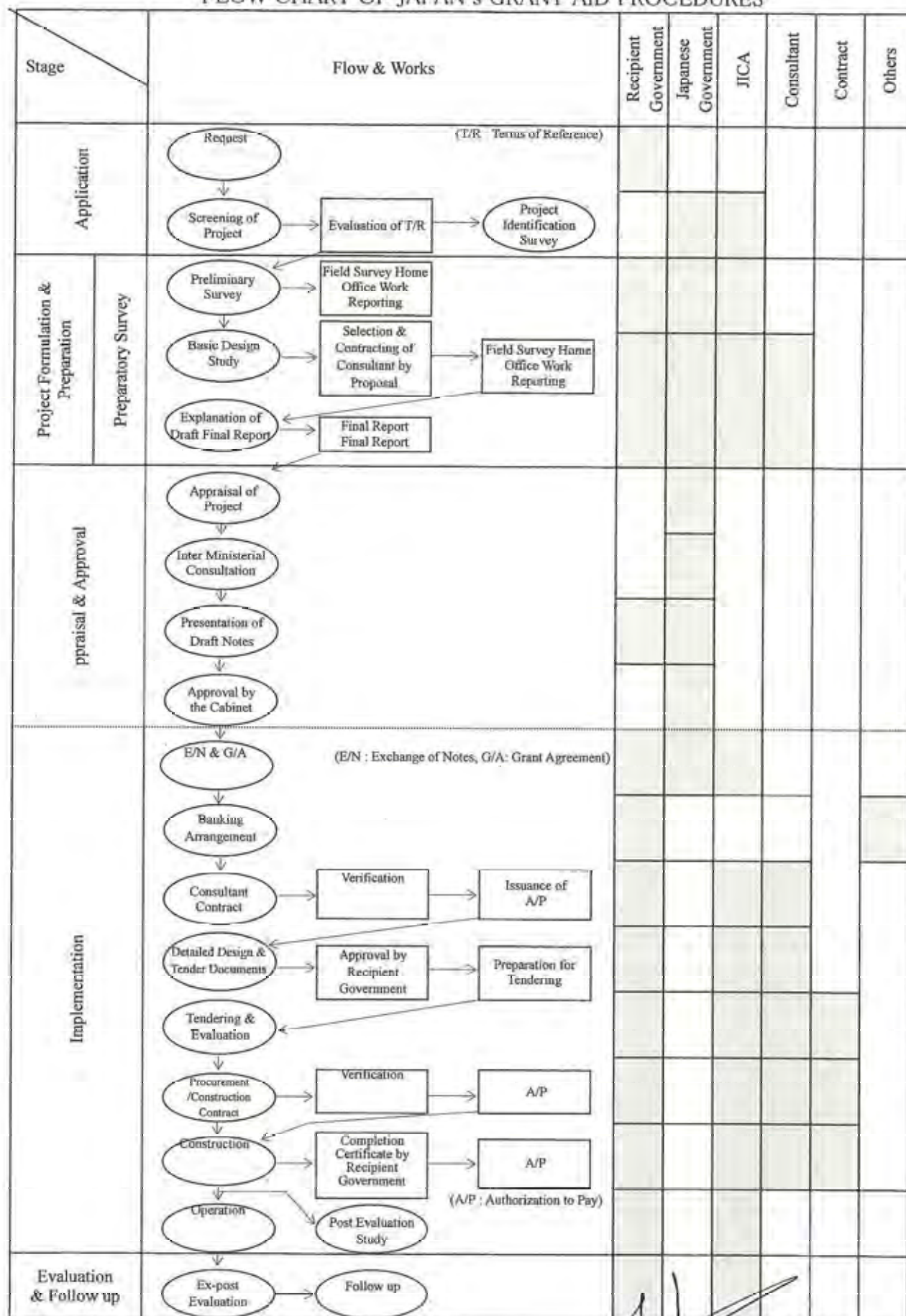


## FLOW CHART OF JAPAN'S GRANT AID PROCEDURES



## Major Undertakings to be taken by Each Government (Construction)

NO	Items	To be covered by the Grant	To be covered by Recipient side
1	To secure land		•
2	To clear, level and reclaim the site when needed		•
3	To construct gates and fences in and around the site		•
4	To construct the parking lot	•	
5	To construct roads		
	1) Within the site	•	
	2) Outside the site		•
6	To construct the building	•	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1)Electricity		
	a.The distributing line to the site		•
	b.The drop wiring and internal wiring within the site	•	
	c.The main circuit breaker and transformer	•	
	2)Water Supply		
	a.The city water distribution main to the site		•
	b.The supply system within the site ( receiving and/or elevated	•	
	3)Drainage		
	a.The city drainage main ( for storm, sewer and others ) to the site		•
	b.The drainage system ( for toilet sewer, ordinary waste, storm drainage and others ) within the site	•	
	4)Gas Supply		
	a.The city gas main to the site		•
	b.The gas supply system within the site	•	
	5)Telephone System		
	a.The telephone trunk line to the main distribution frame / panel (MDF) of the building		•
	b.The MDF and the extension after the frame / panel	•	
	6)Furniture and Equipment		
	a.General furniture		•
	b.Project equipment	•	
8	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		•
	2) Payment commission		•
9	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	•	
	2) Tax exemption and customs clearance of the products at the port of disembarkation		•

	3) Internal transportation from the port of disembarkation to the project site	(●)	(●)
10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		●
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
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 installation of the equipment		●

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)



## Major Undertakings to be taken by Each Government (Equipment)

NO	Items	To be covered by the Grant	To be covered by Recipient side
1	To bear the following commissions to a bank of Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
2	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
	1) Marine(Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project	(●)	(●)
3	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 the recipient country and stay therein for the performance of their work		●
4	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		●
5	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		●
6	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for the transportation and installation of the equipment		●

(B/A: Banking Arrangement, A/P: Authorization to pay, N/A: Not Applicable)

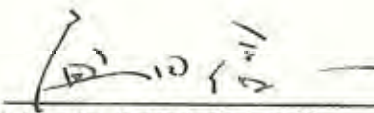
MINUTES OF DISCUSSIONS  
ON THE PREPARATORY SURVEY (BASIC DESIGN STUDY)  
ON THE PROJECT FOR RURAL WATER SUPPLY  
IN THE REPUBLIC OF YEMEN  
(EXPLANATION ON DRAFT BASIC DESIGN STUDY REPORT)


In March 2009, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Preparatory Survey (Basic Design Study) Team on the Project for Rural Water Supply (hereinafter referred to as "the Project") to the Republic of Yemen and through discussion, field survey and technical evaluation of the results in Japan, JICA prepared the draft basic design study report (hereinafter referred to as "the Draft Report").


In order to explain and consult with the Government of Yemen on the components of the Draft Report, JICA sent to Yemen the Draft Report Explanation Team (hereinafter referred to as "the Team"), which was headed by Mr. MASUDA Shinichi, from 7<sup>th</sup> to 13<sup>th</sup> August 2009.

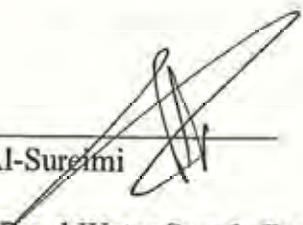
As a result of discussions, both parties confirmed the main items described in the attached sheets.

Sana'a, 11<sup>th</sup> August, 2009

  
\_\_\_\_\_  
Mr. MASUDA Shinichi  
Leader  
Draft Report Explanation Team  
Japan International Cooperation Agency  
Japan

  
\_\_\_\_\_  
Mr. Abdul Rahman Fadhl Al-Eryani  
Minister  
Ministry of Water and Environment  
The Republic of Yemen



  
\_\_\_\_\_  
Mr. Ali Mohammed Al-Sureimi  
Chairman  
General Authority for Rural Water Supply Projects  
The Republic of Yemen



## Attachment

### 1. Components of the Draft Report

The Yemeni side agreed and accepted in principle, the contents of the Draft Report explained by the Team. Both sides confirmed the contents of the Project as shown in Annex-1 and the Project site is as shown in Annex-2.

### 2. Japan's Grant Aid Scheme

The Yemeni side understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Yemeni side as explained by the Team and described in Annex-4, Annex-5A and Annex-5B of the Minutes of Discussions signed by both parties on 15<sup>th</sup> March 2009.

### 3. Responsible and Implementing Agency

3-1. The responsible agency is the Ministry of Water and Environment (hereinafter referred to as "MWE")

3-2. The implementing agency is the General Authority for Rural Water Supply Projects (hereinafter referred to as "GARWSP")

### 4. Project Cost Estimation

Both sides confirmed the project cost estimation borne by the Yemeni and Japanese sides as shown in Annex-3. Since these costs are provisional and would be further examined, they are subject to change. Both sides agreed to take necessary measure to secure the sufficient budget in order to implement the Project.

The project cost estimation as well as the Draft Report should be carefully dealt with and never be released or revealed to any third parties before all the relevant contract is concluded because the information affects the Tender process.

### 5. Schedule of the Study, Project Approval and Necessary Procedure for Implementation

#### 5-1. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Yemen by January 2010.

#### 5-2. Project Approval

Based on the Draft Report and result of discussions by both sides stipulated in the M/Ds, the Project will be evaluated by the Japanese authorities in September 2009 and then final decision will be made by the Japanese Cabinet in October 2009. These schedules are subject to change.

In this process, the contents of the Project are examined as well as the Project itself.



### 5-3. Necessary procedure for Implementation

After the Project is approved by the Japanese Cabinet, both Governments shall proceed to the Exchange of Notes (E/N) and Grant Agreement (G/A). E/N is agreed and concluded between the Government of Yemen and the Government of Japan. G/A is agreed and concluded between the Government of Yemen and JICA.

## 6. Social and Environmental Considerations

The result of the Basic Design Study shows that the Project would make some negative impacts following the JICA's guideline of social and environmental considerations. In order to mitigate the impact, the Yemeni side agreed to take the measures as follows.

### a) Mitigation measures on the environmental and social impact

Item	Mitigation measures
Water rights	<p>To avoid water disputes within a community in the Project sites, GARWSP shall obtain a consent in written form from a community concerning the following matters:</p> <ul style="list-style-type: none"><li>- To use a Project deep well only for a planned water supply facility</li><li>- Not to authorize to develop any new deep wells within the interference area of a Project deep well</li></ul> <p>The consent in written form shall be prepared during Detailed Design Study.</p>
Groundwater	<p>In order to conserve groundwater of the Project sites, GARWSP will instruct a community not to develop any new deep wells within the interference area of a Project deep well, and to operate the pump within the designed discharge rate. When a water supply facility of the Project starts to operate, a water level of a Project deep well shall be monitored by a Water Users Association of the Project site.</p>

### b) Monitoring Plan

The above-mentioned mitigation measures shall be monitored as follows:

#### Monitoring of environmental and social impacts

Item	Methodology	Frequency
Water rights	A Water Users Association monitors any plans to develop new deep wells within an interference area of a Project deep well and reports to GARWSP (branch).	Monthly

Groundwater	A Water Users Association measures periodically a water level of the Project deep wells and the result is reported to GARWSP branch office monthly. All the Water Users Associations of the Project sites receive training to monitor water levels of the Project deep wells during the construction stage.	Monthly
-------------	---	---------

The Yemeni side completed the Environmental Checklist as shown in Annex-4.

## 7. Other Relevant Issues

### 7-1. Software Component of the Project

In order to establish a Water Users Association (WUA) in each Project site, a software component is introduced in the Project. The software component will mainly support for the capacity building of each WUA to be established in the community of the Project site.

The Yemeni side will organize the Social Mobilization Team (SMT), which consists of specialists of the local authority and the GARWSP branch, in each governorate of the Project site. The Yemeni side will secure the budget for the activities of the SMTs as the counterparts in the software component of the Project.

### 7-2. Reexamination of the water source of the Project

Each deep well, which is planned to be utilized as the water source for the water supply facilities, will be reexamined, in general, by pumping tests in the stage of the Detailed Design Study of the Project.

In case that a deep well is found to have considerably lower capacity than planned in the Basic Design, a water supply facility with the well would be redesigned according to its available water sources, which will be confirmed during the Detailed Design Study.

### 7-3. Security during the implementation of the Project

The Yemeni side promised to take necessary measures in order to ensure the security for Japanese nationals and other staffs, who will be engaged in the Project during its implementation.

END.

ANNEX-1: The Contents of the Project

ANNEX-2: The Project Sites

ANNEX-3: Project Cost Estimation

ANNEX-4: Environmental Checklist



**Contents of the Project**

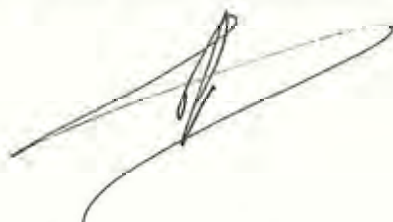
1. Water Supply Facilities Construction

New water supply facilities construction : 13 sites

Rehabilitation of existing water supply facilities : 6 sites

2. Technical Assistance (Soft components)

Organization of water users associations and provision of sanitation promotion activities.



12

## List of Water Supply Facilities

Governorate	Code	Site	Population			Water Supply		Well	New Construction												Rehabilitation										
			Base Year	Growth	Design Year	Unit Supply Amount	Supply amount		Pump			Machinery House		Reservoir				PF	Pipeline	MH	Reservoir										
			2005	%	2015	Lit/Sec	m³/day		Type	Capacity	Head	Type	Qty	25 m³	40 m³	50 m³	75 m³	100 m³	Type	m	Qty	25 m³	40 m³	50 m³	75 m³	100 m³					
Al Mahweel	A-03	Ozlat Al Jaradi	20,766	2.87	30,028	25	751	150	SP	10.4	122																				
									HP	10.4	217																				
									HP	10.4	238																				
Sana'a	S-02	Jaribon	1,611	2.07	2,103	40	34	450	SP	2.0	381	B		1	1	1					3	10,622									
									HP	2.0	81	1 Gen. x 2 pumps																			
	S-04	Qamran-Bait Al Najrani	629	2.07	821	40	33	145	VP	1.2	90	A-2	1	1						3	2,928										
									SP	3.2	246																				
	S-05	Alesh	3,680	2.07	4,804	35	168	300	HP	3.2	227											527	2		1	1					
S-07	Bait Al Hadrami	2,550	2.07	3,329	40	133	410	SP	3.2	276	A-1	1	1							3	7,644			1							
S-09	Ruhm	4,567	2.07	5,961	30	179	470	SP	3.0	377	A-1	1				2				6	17,267										
Dahmar	D-01	Elow Al Mahaf	920	3.04	1,367	40	55	273	SP	2.0	197	1 Gen. x 2 pumps																			
									HP	1.9	129	B	1			1															
									HP	1.6	136	C	1																		
	D-02	Hama-Bait Al Jabar	2,475	3.04	3,654	48	146	310	SP	3.5	307	A-1	1								3	11,953				1					
									SP	3.3	197	1 Gen. x 2 pumps																			
	D-03	Hegrat Al A'sham	1,592	3.04	2,350	40	94	320	HP	2.3	178	B	1								3	5,635			1	1					
	D-05	Maytahat Yaer	1,615	3.04	2,237	40	89	127	SP	2.6	264	A-1	1				1		1			5	4,481								
									HP	2.6	148	C	1																		
D-07	Al Asakora	1,944	3.04	2,870	40	115	304	SP	4.0	276	A-1	1																			
								HP	3.2	162	C	1																			
								HP	0.7	155	C	1																			
Ibb	I-01	Asfal Bani Saba	9,311	2.47	12,787	25	320	305	SP	4.5	247	A-1	1																		
									HP	4.5	239	C	1																		
									HP	4.5	245	C	1																		
	I-02	Al Sans	5,026	2.47	6,276	30	248	272	SP	3.9	304	A-3	1																		
									HP	3.9	165	C	1																		
									HP	3.2	163	C	1																		
	I-04	Al Jahlah & Al Meshraq	10,467	2.47	14,375	20	288	305	SP	4.1	118	1 Gen. x 3 pumps																			
HP									4.1	219	D	1																			
HP									4.1	165																					
Taiz	T-02	Bani Al Shuror	9,385	2.47	12,889	40	516	230	SP	5.1	200																				
									HP	3.9	218																				
									HP	3.9	272																				
									SP	2.6	253																				
									SP	5.4	197	A-1	1																		
									HP	5.4	247	C	1																		
	T-03	Sheh Humran	23,732	2.47	32,591	20	652	400	VP	4.0	153	A-2	1																		
									HP	4.0	244																				
									SP	4.2	205																				
	T-04	Yatog Bani Hamad	8,844	2.47	9,399	25	235	220	HP	4.2	262																				
									SP	3.0	336																				
	T-05	Al Azeez	11,784	2.47	16,183	30	485	240	SP	6.0	242	A-1	1																		
									SP	2.0	231																				
HP									5.0	220																					
T-06	Al Khunha	1,579	2.47	2,169	40	87	200	SP	3.1	154	A-3	1					1				4	16,721									
Total			121,403		168,193		4,678	24	47					26	5	2	8	3	3	45	170,915	2	1	2	8	1	1				

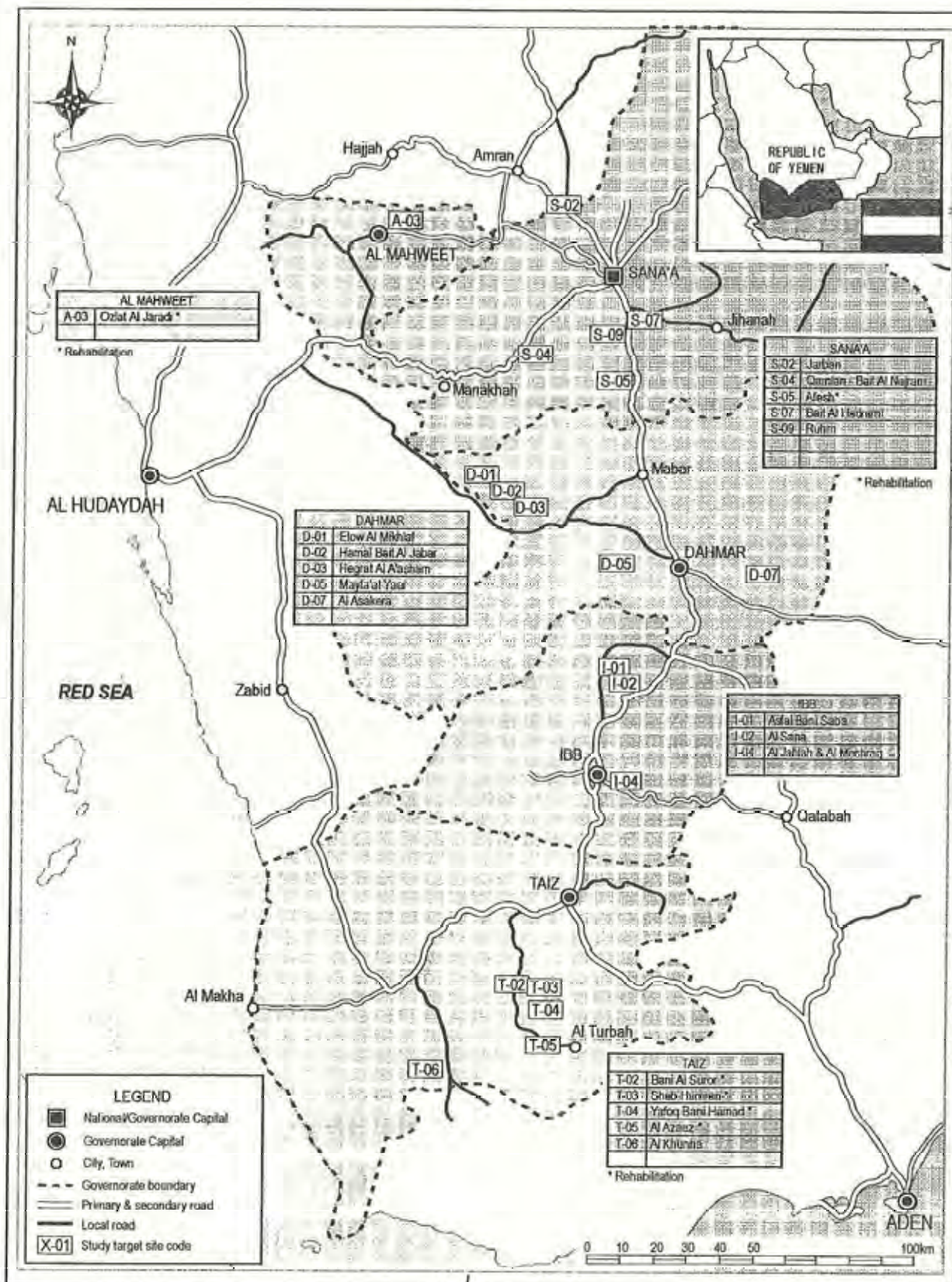
Pump: 47 units  
Generator: 24 units  
Engine: 18 units

SP: Submersible Pump/Borehole Pump  
HP: Horizontal Booster Pump  
VP: Vertical Booster Pump

MH: Machinery House



## The Project Sites



b) Necessary budget to be covered by the Yemeni side

**Total      YR160,498,669 (JPY76.7million)**

Cost Item	Total	Calculation	Remarks
Access road within the site	—	-	To be done by the villagers
Land and leveling for the facilities constructions	-	-	To be donated by the villagers
House connection work (pipe + water meter)	(* <sup>1</sup> )YR156,938,000	-Pipe: 30m/house -Water Meter: 1 No./house	Materials and Installation by the villagers
Advising Commission for Authorization to Pay(A/P)	(* <sup>2</sup> )YR46,024	YR12,552×3times YR8,368×1time	A/P : JPY6,000/time A/P Amendment : JPY4,000/time
Payment Commission to Bank	(* <sup>2</sup> )YR3,514,644	Approx. JPY1,680,000.-	
Total	(* <sup>1</sup> )YR156,938,000	Under the responsibility of the Villagers as a policy of Yemen	
	(* <sup>2</sup> )YR3,560,668	Government of Yemen	

(\*1) To be covered by the villagers.

(\*2) To be covered by the Government of Yemen.



## Environmental Checklist: 18. Water Supply (1)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
1 Permits and Explanation	(1) EIA and Environmental Permits	<p>① Have EIA reports been officially completed?</p> <p>② Have EIA reports been approved by authorities of the host country's government?</p> <p>③ Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied?</p> <p>④ In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?</p>	EPA approved that EIA is not necessary.
	(2) Explanation to the Public	<p>① Are contents of the project and the potential impacts adequately explained to the public based on appropriate procedures, including information disclosure? Is understanding obtained from the public?</p> <p>② Are proper responses made to comments from the public and regulatory authorities?</p>	<p>① Yes. The contents of the Project and the potential impacts were explained to the public through the development study report.</p> <p>② Yes. Proper responses were made to comments from authorities through interviews with them.</p>
2 Mitigation Measures	(1) Air Quality	<p>① Is there a possibility that chlorine from chlorine storage facilities and chlorine injection facilities will cause air pollution? Do chlorine concentrations within the working environments comply with the country's occupational health and safety standards?</p>	① No. There is no chlorine storages attached to the water supply facilities of the Project.
	(2) Water Quality	<p>① Do pollutants, such as SS, BOD, COD contained in effluents discharged by the facility operations comply with the country's effluent standards?</p>	① Yes. Although if the water supply system is completed, there are fears that load on water contamination might increase, but in all of the sites the increase rate will be small because the newly targeted population is relatively small. Therefore, the impact will be small enough to be negligible.
	(3) Wastes	<p>① Are wastes, such as sludges generated by the facility operations properly treated and disposed of in accordance with the country's standards?</p>	① Yes. No sludge will be generated.
	(4) Noise and Vibration	<p>① Do noise and vibrations generated from the facilities, such as pumping stations comply with the country's standards?</p>	① Yes. Pump houses are located away from residences and engines are operated only during the daytime. The generator have sound proof system.
	(5) Subsidence	<p>① In the case of extraction of a large volume of groundwater, is there a possibility that the extraction of groundwater will cause subsidence?</p>	① No. The planned extraction rate is small enough not to cause subsidence, and the deep wells are located in hard rock area.
3 Natural Environment	(1) Protected Areas	<p>① Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?</p>	① No.



Environmental Checklist: 18. Water Supply (2)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
3 Natural Environment	(2) Ecosystem	<p>① Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)?</p> <p>② Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and conventions?</p> <p>③ If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem?</p> <p>④ Is there a possibility that the amount of water (e.g., surface water, groundwater) used by the project will adversely affect aquatic environments, such as rivers? Are adequate measures taken to reduce the impacts on aquatic environments, such as aquatic organisms?</p>	<p>① All of the sites encompass villages where landuse is either settlements or farmlands. Therefore, none of the sites have indigenous fauna or flora species.</p> <p>② According to the above reason, none of the sites are habitats for endangered species.</p> <p>③ Significant ecological impacts are not anticipated.</p> <p>④ No. There is no possibility.</p>
	(1) Resettlement	<p>① Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>② Is adequate explanation on relocation and compensation given to affected persons prior to resettlement?</p> <p>③ Is the resettlement plan, including proper compensation, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>④ Does the resettlement plan pay particular attention to vulnerable groups or persons, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>⑤ Are agreements with the affected persons obtained prior to resettlement?</p> <p>⑥ Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>⑦ Is a plan developed to monitor the impacts of resettlement?</p>	<p>① No. There is no involuntary resettlement caused by project implementation.</p> <p>② No, because adequate explanation is not necessary because no involuntary resettlement.</p> <p>③ No, because there is no involuntary resettlement.</p> <p>④ No, because there is no involuntary resettlement.</p> <p>⑤ No, because there is no involuntary resettlement.</p> <p>⑥ No, because there is no involuntary resettlement.</p> <p>⑦ No, because there is no involuntary resettlement.</p>
4 Social Environment	(2) Living and Livelihood	<p>① Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>② Is there a possibility that the amount of water used (e.g., surface water, groundwater) by the project will adversely affect the existing water uses and water area uses?</p>	<p>① The water vendors seek sufficient demand to sell water in other site which does not have water supply facilities.</p> <p>② No. But if a private well exists within a perimeter of 500 m of the Project target well, discussions are made with well owner.</p>
	(3) Heritage	<p>① Is there a possibility that the project will damage the local archaeological, historical, cultural, and religious heritage sites? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	No. There is no historical, cultural and religious site in the Project area.
	(4) Landscape	<p>① Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	The building structure was designed in consideration of landscape.
	(5) Ethnic Minorities and Indigenous Peoples	<p>① Does the project comply with the country's laws for rights of ethnic minorities and indigenous peoples?</p> <p>② Are considerations given to reduce the impacts on culture and lifestyle of ethnic minorities and indigenous peoples?</p>	There is no ethnic minorities or indigenous people in the Project area.



# Environmental Checklist: 18. Water Supply (3)

Category	Environmental Item	Main Check Items	Confirmation of Environmental Considerations
5 Others	(1) Impacts during Construction	<p>① Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>② If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p> <p>③ If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?</p> <p>④ If necessary, is health and safety education (e.g., traffic safety, public health) provided for project personnel, including workers?</p>	<p>① Yes. Construction will be implemented, located away from residences and during the daytime only.</p> <p>② All of the sites encompass villages where landuse is either settlements or farmlands.</p> <p>③ Construction activities will not affect the social environment through planning at the design stage.</p> <p>④ The Project will provide health and safety education to the Project concerns and also education on sanitation for project personnel and workers.</p>
	(2) Monitoring	<p>① Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts?</p> <p>② Are the items, methods and frequencies included in the monitoring program judged to be appropriate?</p> <p>③ Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and adequate budget to sustain the monitoring framework)?</p> <p>④ Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?</p>	<p>① Yes. The Project will provide training program on monitoring and the communities in the Project sites will monitor environmental items.</p> <p>② Yes. They are appropriate.</p> <p>③ Yes. The Project will establish monitoring teams for the Water Users Associations in each community in the Project sites.</p> <p>④ No. The monitoring data will be taken by the Water Users Association and send it to the Implementing Agency, every month, using a format to be prepared by the Project.</p>
6 Note	Note on Using Environmental Checklist	① If necessary, the impacts to transboundary or global issues should be confirmed (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	No impacts are anticipated.

1) Regarding the term "Country's Standards" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are made, if necessary.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparisons with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

## **APPENDIX 5 SOFTWARE COMPONENT (TECHNICAL ASSISTANT) PLAN**

### **1 Background of Software component plan**

In order to achieve the project purpose of this project, “Safe and sustainable water is supplied to the residents of the Project area (19 sites in 5 Governorates).”, it is important that not only maintenance of water supply facility (Construction of new water supply facilities and Rehabilitation and expansion of existing water supply facilities) , but also operation and maintenance system for water supply facilities is adjusted and those facilities is running sustainably.

Also, in the project for rural water supply in Yemen, it is requested to conduct establishment of WUA and corporate registration to Local Authority for the purpose of implementing operation and maintenance of water supply facilities by the residents in the target sites independently.

Furthermore, the Study and this Project implemented the investigation concerning the target sites in the project for the community associations with running or not-running water supply facility. As the result of this survey, the situations on operation and maintenance of the existing water supply facilities are cleared as follows:

#### **(1) Critical successful factors / unsuccessful factors on Operation and Maintenance**

##### **[Critical Successful Factor]**

- a Progress of Accountability (Account and Decision-making) for facility users
  - Community election for Executive Committee members of WUA
  - Preparation for bylaws/regulations, registration of organization and accounting report to users
  - Decision of important matters in General Assembly of users
- b Effective and financially sound operation and maintenance of facilities
- c Equipment of water meter and save of financially necessary income according to introduction of a setup of water charge at a metered rate



[Critical Unsuccessful Factor]

- a Patripotestal management System by village head
- b Shortage of financially necessary income due to a setup of water charge at low level

(2) Necessity for establishment of process on community-based decision making

For the facility to be planned in this project, 1) operation at the proper pumping discharge and 2) prohibition of new groundwater development in the intervention range are preconditions of the project. Therefore, community association is obligated to keep those conditions responsibly.

However, there are some sites where organized operation and maintenance is not still conducted due to patripotestal management system by village head or where ownership by residents concerning operation and maintenance system is low due to ownership is owned by village head. In such case, it is necessary to establish decision making process by residents mainly in order to meet the above preconditions responsibly.

(3) Necessity for activities to increase awareness on water and sanitation for effective use of sustainably safe water effectively through the water supply facilities constructed / rehabilitated in the project

In order that residents in the sites utilise safe and sustainable water effectively through the maintained water supply facilities, it is necessary for them to prepare for knowledge, attitude and habit on sanitation. Therefore, the improvement of their awareness and habit concerning sanitation should be promoted.

Under such situations, it is justified appropriate to implement soft component (technical assistant) for the purpose of establishment and maintenance of sustainable operation and maintenance system by WUAs, consists of mainly residents in sites, which were established in all the target sites in order to achieve the project purpose.

## **2 Objectives on the software components**

In order to achieve the project objective of “Safe and sustainable water is supplied to the

residents of the Project area and assure sustainability of impact brought by the Project, the software component of the Project is implemented to establish target community-based operation in provision of technical guidance to the target communities.

### 3 Output on the software component

Expected Outputs are indicated as follows:

【Expected Output (1)】 : Community-based operation and maintenance mechanism is established and enhanced in the target community

【Expected Output (2)】 : Awareness on water and sanitation is enhanced in the target community

### 4 Means to confirm the achievement of the expected outputs

Means to confirm the achievement of the expected outputs indicated in “3 Output on the software component” and indicators are pointed out as follows:

【Expected Output (1)】 : Community-based operation and maintenance mechanism is established and enhanced in the target community

【Indicator 1-1】	WUAs are established and registered in all of the 19 target sites during the Project.
【Mean 1-1】	WUA establishment conditions and registration documents on local authority are confirmed at the end of software component.
【Indicator 1-2】	Sustainable operation and maintenance system of WUA is prepared.
【Mean 1-2】	Bylaws / regulations and records for operation and maintenance and financial documents are confirmed at the end of software component.
【Indicator 1-3】	Scheme operator (i.e. pump operator, plumber, fee collector) is prepared in WUA.
【Mean 1-3】	Documents on activities for scheme operator (i.e. pump operator, plumber, fee collector) are confirmed at the end of software component.

【Expected Output (2)】 : Awareness on water and sanitation is enhanced in the target