PART H ENVIRONMENTAL AND SOCIAL CONSIDERATIONS

H1 EIA Process in Solomon

Solomon Islands Environment and Conservation Division (ECD) in the Ministry of Natural Resources provides *Solomon Islands Environmental Impact Assessment Guidelines* (hereinafter referred to as "the Guideline") for planners and developers. Figure H1-1 shows the steps recommended in the Guideline. The proponent of project submits the draft public environmental report (PER) or summary appraisal.

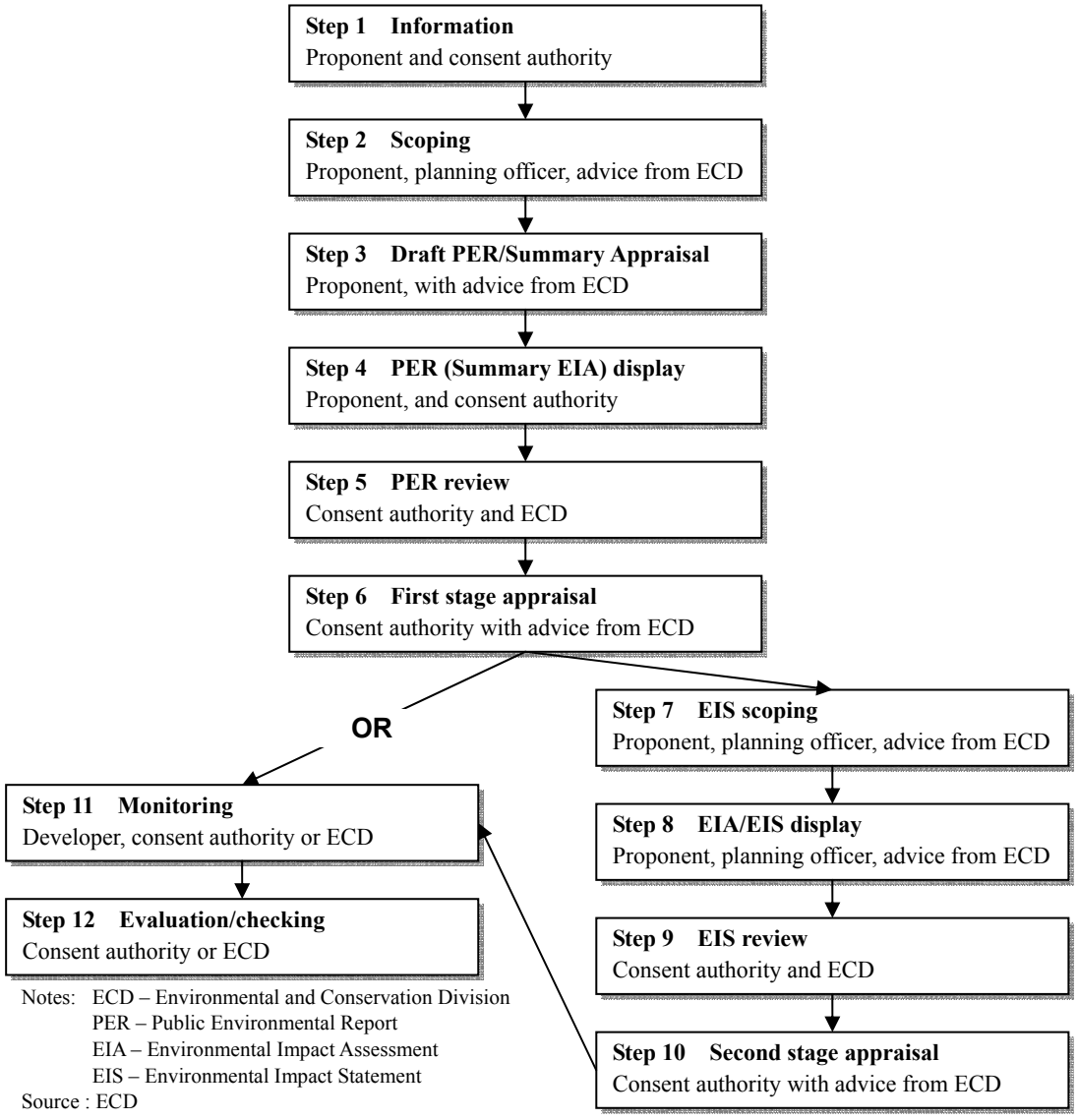


Figure H1-1 Steps of PER/EIA Process

In order to get approval from ECD, proponent of this project has to submit the draft PER or summary appraisal to ECD in line with the Guideline. The following activities are necessary for proposed project.

H2 Environmental Impact of the Projects for Honiara

H2.1 Categorization and its Reason

This project in the Study is categorized as B type according to JICA Guideline because there are little environmental and social impacts. However, issues of water right in the customary land should be carefully taken into consideration.

H2.2 Overall Environmental and Social Condition on the Project Area

In Honiara, most of the town area is developed and utilized as residential and commercial area. Most of the roads belong to the public land. There is an enough space of about 3 m width on both sides of the road, where pipe line can be laid. Moreover, boreholes and the related facilities can be constructed in the additional space along the roads.

The ownership of the land is the sensitive issue in the Solomon Islands. The land of Solomon Islands is divided into three groups, such as town, alienated land and customary land. Town and alienated land are controlled by the government under the modern laws and regulations. In the alienated land, however, some disputes occur between the government and the native tribes as the land is originally customary land which was recently transferred to the government. Customary land is traditional common land owned by native tribes. The registration procedure is on the way. However, there still remains no clear boundary and unclear ownership in some areas. Some water sources and facilities of SIWA are located in the customary land. Discreet and sensitive management is requested.

There is no protected area in/around the area for proposed project. No endangered/valuable species is reported in the project area. Plenty of spring can be found in Honiara area. But dug well can not be found in Honiara, and there are a few existing boreholes except for boreholes owned by SIWA. No hazardous chemicals have been found in the ground water.

H2.3 Adverse Environmental and Social Impacts

For environmental and social consideration, proposed project for Honiara has been evaluated by in the Study.

H2.3.1 Water Supply Facility Improvement Project

Following 3 (three) options have been proposed as the water supply facility improvement projects in Honiara.

- Option J-1
- Option J-2
- Option J-3

Among the above options, Option J-1 will be evaluated hereinafter because the number of boreholes to be newly developed is the biggest and therefore the impact on the environment is considered the largest.

H2.3.2 Sewerage Facility Improvement Project

The main component of this project is the rehabilitation of the sewage outfall structures. It has been adopted from the optimum option for the sewerage facility improvement project proposed in the AusAID report. The optimum option has been selected in view of financial aspect and environmental impact aspect. Therefore, only one option has been evaluated in the Study.

H2.3.3 Evaluation Results

Evaluation results are summarized in Table H2-1.

Table H2-1 Check List for Scoping (Honiara)

Item			Evaluation	Reason
Social Environment	1	Resettlement	D	Most of the new facilities will be constructed under public roads and inside public lands. Therefore, resettlement will not occur.
	2	Economic Activities	D	No impact on local economic activities is expected.
	3	Land use and utilization of local resources	D	Facilities will be constructed in the public land and the scale of the facilities is small. Therefore, no impact is expected.
	4	Social institutions and local decision making	D	No impact is expected.
	5	Existing social infrastructure and services	D	No impact is expected.
	6	The poor, indigenous and ethnic people	D	No impact is expected.
	7	Misdistribution of benefit and damage	D	No impact is expected.
	8	Cultural Property	D	No impact is expected.
	9	Water rights and Rights of Common	B	There remain some issues on the water rights and rights of common in the customary land, even after the legal resolution between the government and the land owners. Careful dealing is requested.
	10	Public health condition	D	The public health condition will be improved by the project.
	11	Sanitation	B	Sludge must be treated adequately.
Natural Environment	12	Topography and Geology	B	During construction of new well facilities, topography and geographical features may be slightly affected.
	13	Groundwater	B	Development of groundwater may cause some impact. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	14	Hydrological situation	B	Development of water resources may cause some impact on hydrological situation. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	15	Coastal zone	B	Fishery and coral reef should be taken into consideration. However, the impact will be small if any because sewage discharged to the sea is small.
	16	Landscape	B	Construction of facilities may cause small change of landscape.
	17	Fauna and flora	D	No impact is expected. No record of valuable species. Scale of facilities is small.
Pollution	18	Air pollution	D	No impact is expected.
	19	Water pollution	B	Drainage and sludge shall be treated adequately.
	20	Soil Contamination	D	No impact is expected.
	21	Noise and Vibration	B	Pumping and generator may cause noise and vibration. However the impact will be small because the scale of pump facilities is small.
	22	Land subsidence	D	No impact is expected.
	23	Offensive odor	B	Odor from sludge drying facility is expected.
	24	Bottom Sediment	D	No impact is expected.

Note: Evaluation categories
A: Serious impact is expected, B :Some impact is expected, C : Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress), D: No impact is expected. IEE/EIA is not necessary.
Source : JICA Study Team

H2.4 Consensus with Stakeholders

H2.4.1 Consensus on Facility Improvement Plan

In the workshops held for pilot projects, other than the discussions on the pilot projects, the facility implementation plan for the Study was explained to the stakeholders attended. Since the water supply facilities proposed in the facility improvement plan in the Study will be constructed in the public areas or in the premises of the existing stations and the scale is small, negative impact on the

environmental and social considerations will not be expected. After the explanation and discussions on the facility improvement plan, the stakeholders attended understood the above.

H2.4.2 Consensus on Water Resources Development

Groundwater development for water supply is proposed in this Study. Stakeholders will be limited to SIWA and Ministry of Natural Resources in connection with new development of groundwater resources in Honiara as explained below.

- Honiara is rich in precipitation, and traditionally they used water-tanks to collect rain-water. Therefore, dug-wells have not used until now and there is no stakeholder who use dug-wells.
- Private drilling of borehole is requested to be registered to SIWA and MNR. Private drilling is restricted because SIWA does not allow private drilling to concere the existing borehole for water supply. Therefore, there are few stakeholders who use borehole except for SIWA.

Therefore, only MNR and SIWA are considered proper stakeholders relating to new groundwater development, The Study Team explained to MNR and SIWA about environmental impact by Mid-term water supply plan, and got full consensus from the MNR and SIWA.

H3 Environmental Impact of the Projects for Provincial Centers

For the mid-term facility improvement plan for provincial centers of Noro, Auki and Tulagi, only the plan for Auki has been proposed because it is considered that the facility improvement plan for other two towns are not needed as a mid-term plan although the long-term plan is required for these towns. Therefore, the environmental impact for the provincial centers has been examined only for the proposed project in Auki.

H3.1 Categorization and its Reason

This project is categorized as B type according to JICA Guideline because there are little environmental and social impacts. However, issues of water right in the customary land should be carefully taken into consideration.

H3.2 Overall Environmental and Social Condition on the Project Area

Developed residential area is narrow and most of the area outside of the town is arable/agricultural land or forest.

The ownership of the land is the sensitive issue in the Solomon Islands. Discreet and sensitive management is requested.

There is no protected area in/around the project area. No endangered/valuable species is reported in the project area. There are a few existing boreholes and no dug well in Auki, though there is high potential for groundwater development. No hazardous chemicals have been found in the ground water.

H3.3 Adverse Environmental and Social Impacts

For environmental and social consideration, proposed project for Auki has been evaluated in the Study. The proposed project consists of the following component.

H3.3.1 Water Supply System Improvement Project

In Auki, project for rehabilitating water intake dam, and constructing water transmission mains and reservoir funded by Asian Development Bank (ADB) is under way and will be completed within the year 2006. After completion of the ADB project, the water supply facilities will be able to serve for

the demand of the target year 2010 except the water source capacity. As the new water source, two (2) boreholes will have to be developed in the premises of Low Level Tank.

H3.3.2 Sewerage Facility Improvement Project

Since there is no existing sewerage facility in Auki, sewerage facility improvement project is not proposed.

H3.3.3 Evaluation Results

Evaluation results are summarized in Table H3-1.

Table H3-1 Check List for Scoping (Auki)

Item			Evaluation	Reason
Social Environment	1	Resettlement	D	Most of the new facilities will be constructed under public roads and inside public lands. Therefore, resettlement will not occur.
	2	Economic Activities	D	No impact on local economic activities is expected.
	3	Land use and utilization of local resources	D	Drilling of boreholes will be executed and water supply facilities will be constructed in the public land within town boundary. Therefore, no impact is expected.
	4	Social institutions and local decision making	D	No impact is expected.
	5	Existing social infrastructure and services	D	No impact is expected.
	6	The poor, indigenous and ethnic people	D	No impact is expected.
	7	Misdistribution of benefit and damage	D	No impact is expected.
	8	Cultural Property	D	No impact is expected.
	9	Water rights and Rights of Common	B	There remain some issues on the water rights and rights of common in the customary land, even after the legal resolution between the government and the land owners. Careful dealing is requested.
	10	Public health condition	D	The public health condition will be improved by the project.
	11	Sanitation	D	No impact.
Natural Environment	12	Topography and Geology	B	During construction of new well facilities, topography and geographical features may be slightly affected.
	13	Groundwater	B	Development of groundwater may cause some impact. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	14	Hydrological situation	B	Development of water resources may cause some impact on hydrological situation. It is necessary to formulate the appropriate plan in order to avoid the serious impact.
	15	Coastal zone	D	No impact.
	16	Landscape	B	Construction of facilities may cause small change of landscape.
	17	Fauna and flora	D	No impact. No record of valuable species. Scale of facilities is small.
Pollution	18	Air pollution	D	No impact.
	19	Water pollution	D	No impact.
	20	Soil Contamination	D	No impact.
	21	Noise and Vibration	B	Pumping and generator may cause noise and vibration. However the impact will be small because the scale of pump facilities is small.
	22	Land subsidence	D	No impact.
	23	Offensive odor	D	No impact.
	24	Bottom Sediment	D	No impact.

Note: Evaluation categories

A: Serious impact is expected, B :Some impact is expected , C : Extent of impact is unknown (Examination is needed. Impacts may become clear as study progress), D: No impact is expected. IEE/EIA is not necessary.

Source : JICA Study Team

H3.4 Consensus with Stakeholders

H3.4.1 Consensus on Facility Improvement Plan

For the facility improvement plan in the Study for provincial centers, the development of water sources in Auki is proposed only. Water supply facilities in other provincial centers are considered as operational up to at least 2010.

The development of water sources in Auki includes construction of two (2) boreholes in the premises of the existing transmission pump station and Low Level Tank site. Therefore, negative impact on the environmental and social considerations will be very small by construction of above mentired facilities.

H3.4.2 Consensus on Water Resources Development

New boreholes are planned to be drilled near the existing low level tank of SIWA, which is located in site of SIEA. Plan of drilling has been already explained to SIEA. It is the existing boreholes that will suffer damage from new groundwater development. However, SIWA is only user of the groundwater from wells in Auki. Therefore, SIWA and MNR are proper stakeholders relating to new groundwater development, because SIWA is the biggest user of groundwater in Auki, and MNR is in charge of water resources management of provincial town. The Study Team explained to SIWA and MNR about environmental impact by Mid-term water supply plan, and got full consensus from the SIWA and MNR.

PART I URGENT REHABILITATION PLAN

I1 Urgent Rehabilitation Plan for Honiara

Water supply systems/facilities in Honiara have various damage that requires rehabilitation. Although most of this damage is within the level of SIWA's technical maintenance capability, the facilities constructed in 1996-1998 through Japan's Grant Aid project called "the Project for Improvement of the Water Supply System in Honiara" were damaged seriously under the ethnic tension from 2000 to 2003 and some of the facilities have not been operable ever since. The facilities in question are the target for urgent rehabilitation.

The targeted facilities, hereinafter referred to as "the original facilities", consist of the following systems:

- White River JICA Bores System
- Mataniko JICA Bores System
- Kombito JICA Bores System

Since the targeted facilities were constructed through Japan's Grant Aid, SIWA requested supplemental assistance in the form of so-called follow-up cooperation (hereinafter referred to as "F/U") to the Japanese Government, for rehabilitation of the facilities. Subsequently, the Study Team investigated the facilities' conditions in view of the appropriateness as F/U.

I1.1 Condition before Rehabilitation and Rehabilitation Plan

I1.1.1 Present Conditions of the Original Facilities

The present conditions of the original facilities are summarized by system, as shown in Table I1-1.

Table I1-1 Present Conditions of Original Facilities by System

System	Actual Condition	Causes of Damage/Trouble
White River JICA Bores System	Submersible Pump and Water Transmission Facilities are broken/removed and /or inoperative and all the facilities of system are not in use.	Electric power cable went dead in around 1999. Since then, all the facilities have not been working. Later, in the ethnic tension, some electric devices etc. were destroyed.
Mataniko JICA Bores System	System has been generally working except M-4 bore hole facility. Operation of M-4 has been suspended due to low groundwater level. Until the present time, some mechanical troubles happened. SIWA repaired those troubles by transferring the equipment/parts from White River JICA Bores System.	Groundwater level of M-4 has been low since the commencement of operation.
	For JICA Skyline Tank, there is water leakage through bolt holes, so that the tank is not in use.	Approx. 20 bolts were taken off and lost at JICA Skyline Tank. Putting new bolts will be done by SIWA.
	As riser pipe of submersible pump is made with galvanized steel, the pipe is easily corroded.	It is considered that corrosion of riser pipe is caused by water temperature.
Kombito JICA Bores System	Although submersible pump facilities were destroyed by the ethnic tension, SIWA restored it by self-effort in December 2004.	Submersible pumps and electrical panels were destroyed under the ethnic tension.
	The water receiving tank is damaged and not in use. SIWA has currently no plan to re-use the tank as they changed the water transmission route and water supply area.	Water receiving tank was damaged by neighboring resident before the ethnic tension.
	As riser pipe of submersible pump is made with galvanized steel, the pipe is subject to corrosion.	It is considered that corrosion of riser pipe is caused by water temperature.

Source : SIWA

I1.1.2 Present Capacity as Water Source

The capacity of bores was confirmed by a pumping test in this Study. Although eleven bores were drilled under Japan's great aid project in 1997, a pumping test was carried out for six bores, the capacity of which is considered lower than the original state. With this in mind, bore washing was carried out to restore the bore capacity for those bores showing a lower capacity in the pumping test. As a result of the pumping test and bore washing, it emerged that most of the bores, except for M-4, had enough capacity for water source at the original design level.

I1.1.3 Required Works for Rehabilitation

(1) White River JICA Bores System

The total capacity of bores is 3,500 m^3/day. This capacity represents approximately 30% of the present capacity of Konglai Spring, which is the main water source for Honiara, and is capable of covering the required quantity for the Point Cruz Zone, which is the center of Honiara. Since the system can supply water to the center of Honiara, in case of unexpected spring blockages or troubles, the restoration of the damaged White River JICA Bores System is a valuable and necessary goal for the stable water supply for Honiara.

Since systems such as pumps and water transmission facilities have been destroyed, the restoration requires not only equipment replacement but also system reconstruction. The necessary system restorations are as follows:

- Restoration of Pumping System for Bores

- Restoration of Water Transmission System to the JICA White River Tank
- Restoration of the disinfection system
- Restoration of the electric receiving/distributing system

(2) Mataniko JICA Bores System

It is recommended to suspend the operation of one bore, "M-4", due to a low water level, although the capacity of the other 4 working bores are in good condition. Therefore, there is no restoration subject for water source capacity in this system.

Repair of the JICA Skyline Tank is necessary. However SIWA has an idea of rehabilitation of the Skyline water reserving system, which includes reconstruction of the SIWA Skyline Tank and improvement of the total storage capacity using the same. Therefore, the repair is recommended to manage in the mentioned rehabilitation.

Countermeasures against the corrosion of riser pipe should urgently be taken to avoid accidents, such as a submersible pump falling down. The following work is necessary as a countermeasure:

- Replacement of the riser pipe

(3) Kombito JICA Bores System

SIWA restored the system at the end of 2004. Since then, the system has supplied water to different areas from those specified in the original design. In the original design, it was intended to transmit water to the JICA Panatina Tank through the receiving tank. However, SIWA modified the system and transmits water currently to the EU Tank. Under the current system the receiving tank cannot be utilized; hence repair of the damaged receiving tank is not urgent.

Countermeasures against the corrosion of riser pipe should urgently be taken. The following work is necessary in the same way as in the Mataniko System:

- Replacement of the riser pipe

I1.1.4 Justification of Rehabilitation

The above required works are justified as described below:

(1) Urgency

The required rehabilitation is necessary for a stable water supply for Honiara. Therefore urgent rehabilitation is necessary.

(2) Sustainability on Operation and Maintenance

SIWA has a capacity for regular maintenance and small scale repair. There is no remarkable problem for operation and maintenance after rehabilitation.

(3) Technical Viability

Since the capacity of boreholes, which are targets of the rehabilitation, confirms that water pumping is allowed at the original design level, the system restoration is viable in capacity.

The equipment installation works can be done by SIWA. SIWA's engineering skill is proved by the Kombito JICA Bores System Restoration.

(4) Clearance of Water Right and Access to Site

There is no remarkable problem except W-4. The land lease contract for W-4 is terminated and must be renewed. SIWA has started the necessary procedures to renew the W-4 land lease contract.

I1.1.5 Priority for Rehabilitation by Follow-up Cooperation

Taking the SIWA's priority and the following evaluation into consideration, the priority for restoration/rehabilitation utilizing F/U was set as Table I1-2.

- Priority in view of the water supply system
- Priority in view of the facility function in a system
- Priority in view of SIWA's technical and financial difficulties
- Priority in view of objectives of F/U scheme and equipment to be procured

Table I1-2 Priority for Rehabilitation by Follow-up Cooperation

System	Facility	Content	System	Facility Function	Technical/ Financial	Objectives	SIWA's Priority	Evaluated Priority of F/U
White River JICA Bores System	Water Source	Procure Major Equipment	A	-	A	A	A	**A**
		Installation	A	-	X	-	X	**X**
		Procure Spare Parts	A	-	C	X	C	**X**
	Water Transmission	Procure Major Equipment	A	-	A	A	A	**A**
		Installation	A	-	X	-	X	**X**
		Procure Spare Parts	A	-	C	X	C	**X**
	Disinfection	Procure Major Equipment	A	-	A	A	A	**A**
		Installation	A	-	X	-	X	**X**
		Procure Spare Parts	A	-	C	X	C	**X**
Mataniko JICA Bores System	Water Source	Procure Spare Parts	B	-	C	X	C	**X**
		Procure Riser Pipe	B	-	A	B	B	**B**
Kombito JICA Bores System	Water Source	Procure Spare Parts	B	-	C	X	C	**X**
		Procure Riser Pipe	B	-	A	B	B	**B**

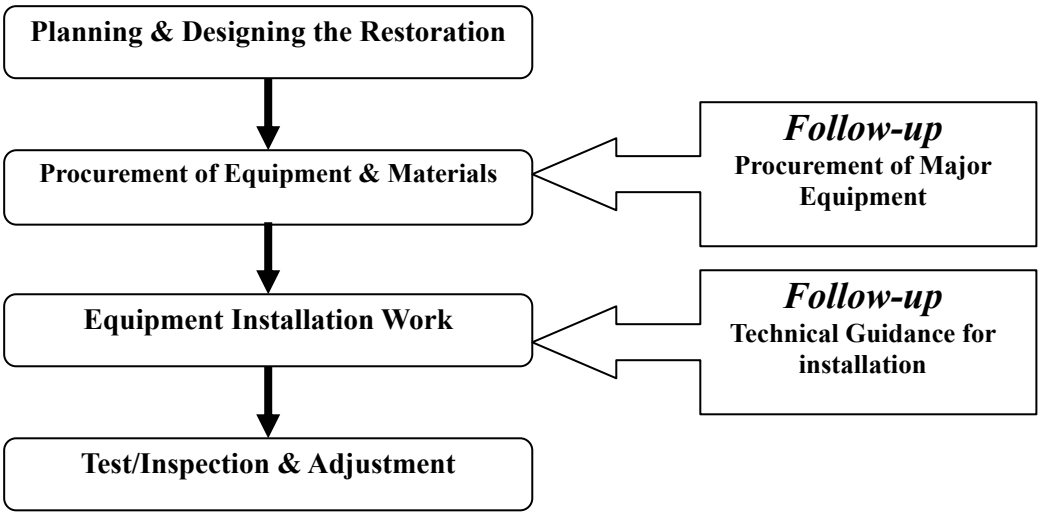
Remark A: High priority, B: Mid priority, C: Low priority, X: To be done by SIWA
Source : JICA Study Team

I1.2 Execution of Rehabilitation Works

After the examination of the study results described in the previous clause, JICA decided to assist SIWA in terms of the mentioned rehabilitations in the procurement of the necessary major equipment through F/U.

I1.2.1 Position of Follow-up Cooperation in Rehabilitation

F/U is positioned as shown in Figure I1-1 in the rehabilitation flow. The works not covered by F/U are under the scope of SIWA.



Source : JICA Study Team

Figure I1-1 Position of Follow-up Cooperation

Although F/U covers the equipment delivery to the installation site, inspection of the procured goods and instructions to the supplier for delivery details are under the scope of SIWA.

I1.2.2 Schedule of Follow-up Cooperation

One local supplier was selected by JICA on December 29, 2005 for the equipment procurement, through competitive quotations. The contract amount with the supplier is Aus$374,622.00-(US$284,525.41-). Through the meeting with the supplier and SIWA, the schedule of rehabilitation is planned as follows:

- F/U equipment arrival at Honiara : Completed by the end of May 2006.
- Equipment installation and restoration : From mid-May 2006.
  to end June 2006

I2 Urgent Rehabilitation Plan for Tulagi

The water supply system for Tulagi has no disinfection facility. Since coli forms are sometimes found in the supplied water, there is a risk of pollution. A disinfection facility is indispensable in a drinking water supply system, therefore its construction is planned as part of the Urgent Rehabilitation.

The drinking water for Tulagi (Tulagi Island) is transmitted from the neighboring island i.e. Florida Island. Since some houses connect to the transmission line after its crosses the sea and before the water reservoir, the appropriate installation site should be located just after the sea crossing.

The estimated cost for this urgent rehabilitation is US$30,284.00-. As SIWA is facing financial difficulty in this budget preparation, it is recommended to request financial assistance to the central government of the Solomon Islands or international donors.

I3 Urgent Rehabilitation Plan for Auki

Since a rehabilitation project for the water supply system is underway in Auki thanks to the assistance of the Asian Development Bank (ADB), no urgent rehabilitation plan for Auki is required.

PART J CONCLUSIONS AND RECOMMNEDATIONS

J1. Establishment of Leakage Reduction Unit

In order to conduct leakage detection survey and replace pipelines with large leakage on a regular basis, SIWA should establish a leakage reduction unit consisting of seven (7) staff - two (2) technicians and four (4) field workers under the supervision of water supply department manager.

The Leakage Reduction Unit to be established shall conduct the following work;

- To prepare a leakage reduction plan including target areas, leakage survey schedule, budget, etc. at the beginning of fiscal year.
- To conduct leakage survey and detect large leakage point or section on the pipeline according to the plan.
- To repair the pipelines or replace then with new pipes.
- To record the repairs and replacement of pipelines on the drawing.
- To update GIS data.

J2. Monitoring and Development of Water Source

Monitoring is necessary for development and management of water sources. Water sources should be monitored in both quantity (river discharge and groundwater level) and quality. The monitoring work should be carried out continuously before/after water resources development. Result of monitoring before the development will give information on its potential, and result of monitoring after the development will give information on its management. Before implementation of monitoring, network for the monitoring must be established. Then, items to be monitored and frequency of the monitoring can be decided.

In this Study, various kinds of field survey were carried out to observe river-discharge, groundwater-level and water quality at many points. It is proposed that the observation points of this Study should be established as new monitoring network. Regular monitoring (once a month) will give long-term fluctuation of river-discharge and water quality of the Study area. In addition to it, productive boreholes should be included in the monitoring network, and groundwater level of the boreholes should be observed regularly.

J3. Countermeasures against Contamination of Water Source and Tap Water

In the water quality survey of the Study, coliform group was detected in the groundwater from boreholes as a water source and from the tap water supplied through water distribution system. Therefore, SIWA should take following countermeasures.

(1) Water Source

- Concrete slab around boreholes should be reconstructed, which can prevent infiltration of wastewater into the ground.
- Type of septic tank should be changed from seepage type to storage type such as concrete pit. In this case, community septic tank is desirable in view point of maintenance by SIWA. Night soil will be regularly collected by vacuum truck of SIWA.
- For the area near the boreholes, public sewage collection and discharge system should be constructed

(2) Tap Water

- Residual chlorine at the end of distribution network must be checked more strictly.

- Daily maintenance of chlorination facilities and control of chlorine dosage should be done.

J4. Environment and Social Considerations

In line with the Solomon Islands Environmental Impact Assessment Guidelines, the mid-term facility improvement plan and urgent rehabilitation plan do not require to carry out environmental impact assessment. However, it was found that there remain some issues or impacts on some aspects of both social and natural environment in the process of scoping. Therefore, SIWA should have consideration for the expected issues/impacts of social and natural environment, and also should monitor those issues/impacts during and after implementation of the above-mentioned plans.

J5. Enhancement of Public Relations/Participation Activities

Complaints or opinions about SIWA's water supply services are reported in the newspaper. Result of the socio-economic survey also shows that most of the respondents have some opinions, complaints or requests/suggestions about water supply services. However, dissemination of information regarding water supply to the public is not enough to obtain understanding on policy and basic conditions of water supply services because there is no officer in charge of public relations.

Although draft strategic plan for community consultation and education and customer service was formulated in 1998, it has not been adopted and public relations activities are stagnant. Therefore, it is necessary to appoint a person in charge of public relations and community education. The officer in charge should review the strategic plan in line with the current business environment. In review of the strategic plan, key issues to be addressed should be identified and put in the strategies with performance indicators and methods to get that information. Based on the result of socio-economic survey and community workshops, the following aspects should be included in the strategic plan.

(1) SIWA Staff Involvement in Public Relations/Participation Activities

Field staff and metre readers should be involved in public relations/participation activities as well as customer services officers because they are most visible for the customers.

(2) Regular Issue of Newsletters/Publications

SIWA's policy, activities, information about water supply services should be disseminated periodically in order to obtain understanding user pay principle, water conservation, responsibility of the customers, etc.

(3) Water Talks for School Children and Housewives

One way to be successful in educating the general public in water use, especially in water conservation, is to instil awareness from a young age. By doing so, it is hoped that the children will grow up to be citizens who practise water conservation as part of daily life and not something which is done when there is a special campaign. In the process, the children will indirectly "educate" their parents and siblings as well. Housewives are prime users of water so it is also effective to raise housewives' awareness of water use behaviour, user pay principle, etc. in order to control water demand and save the expenses of water supply for both supply and demand sides.

J6. Presentation of Options for Expanding and Improving Water Supply Services

(1) Access to the Piped Water for the Low Income Households

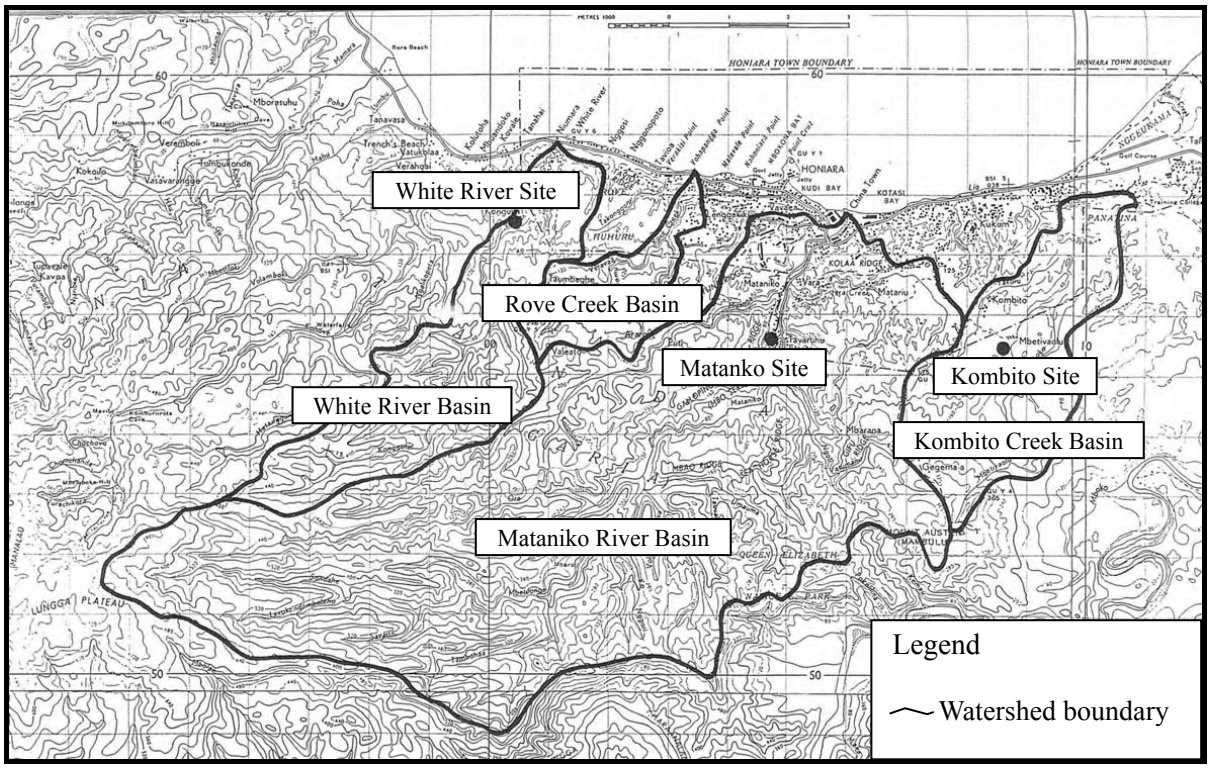
It is not affordable for the low income households to connect the piped water individually because total amount of connection fee and deposit, which are to be paid for new connection, is almost the same as annual average income of households in Burns Creek even though monthly water bills can be paid. In

order to improve access to the piped water, it is necessary for SIWA to show some options to alleviate the burdens on new connection to the low income households. For this purpose, output of PP-4 is one of the options to consider the measures to improve access to the piped water for the low income households.

(2) Repair of Leaking Taps and Pipes

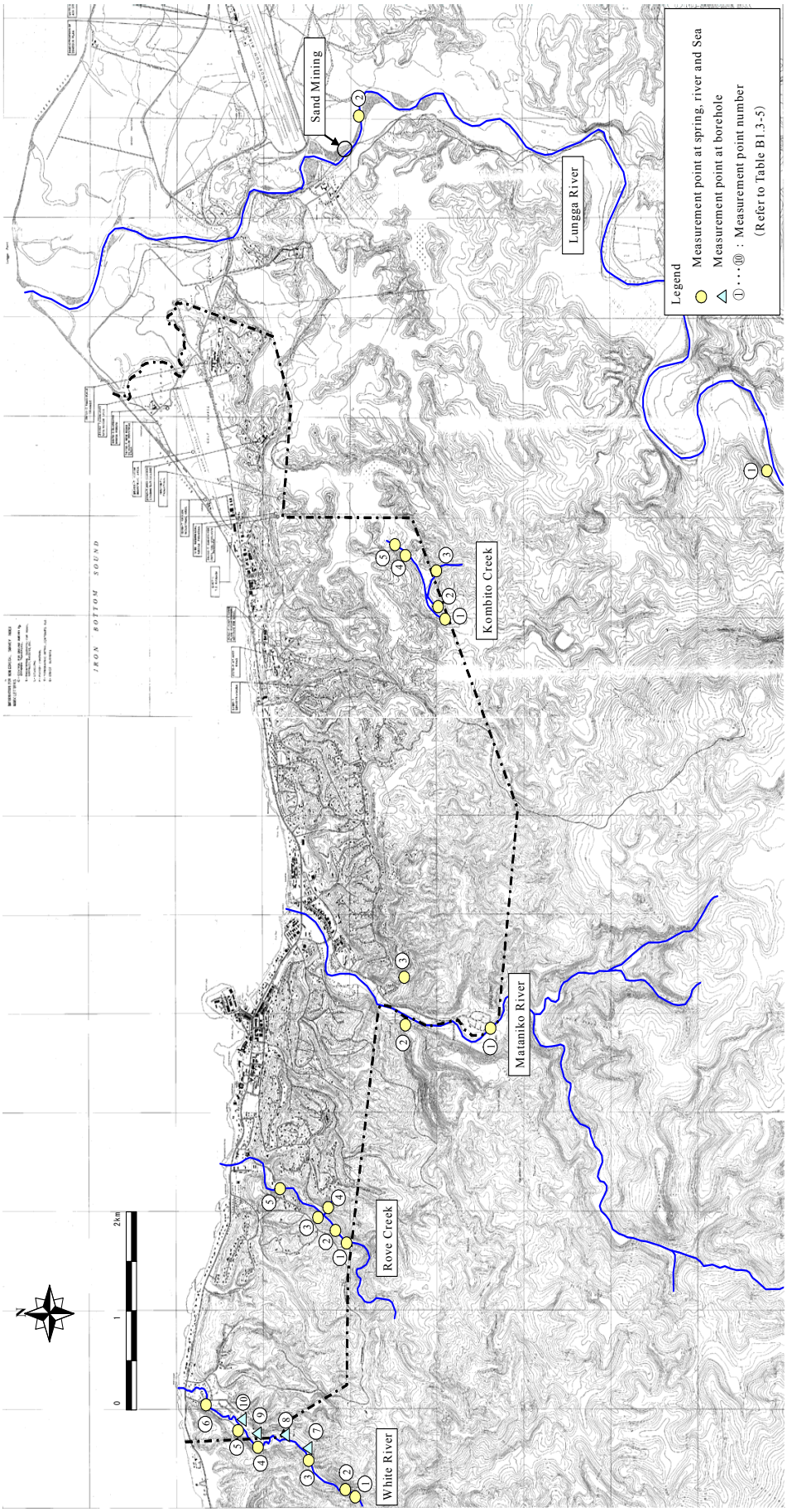
Many customers complain to SIWA about high water bill due to leakage. Repair of leakage from taps and pipes should be done by the customers, however some households do not have enough money to repair or replace the equipment. There are many cases where the leaking taps or pipes are left unfixed. According to the current system, the customer will inform SIWA when they identify leaking taps or pipes. However, some households cannot afford to repair the leaking taps and pipes. Improvement of water services equipment is important for promotion of water conservation as well as raising public awareness. Therefore, it is necessary for SIWA to show some options to make repair of leaking taps/pipes affordable or easy to practice. Cost sharing system examined under the PP-4 is much suggestive for this point.

Annex



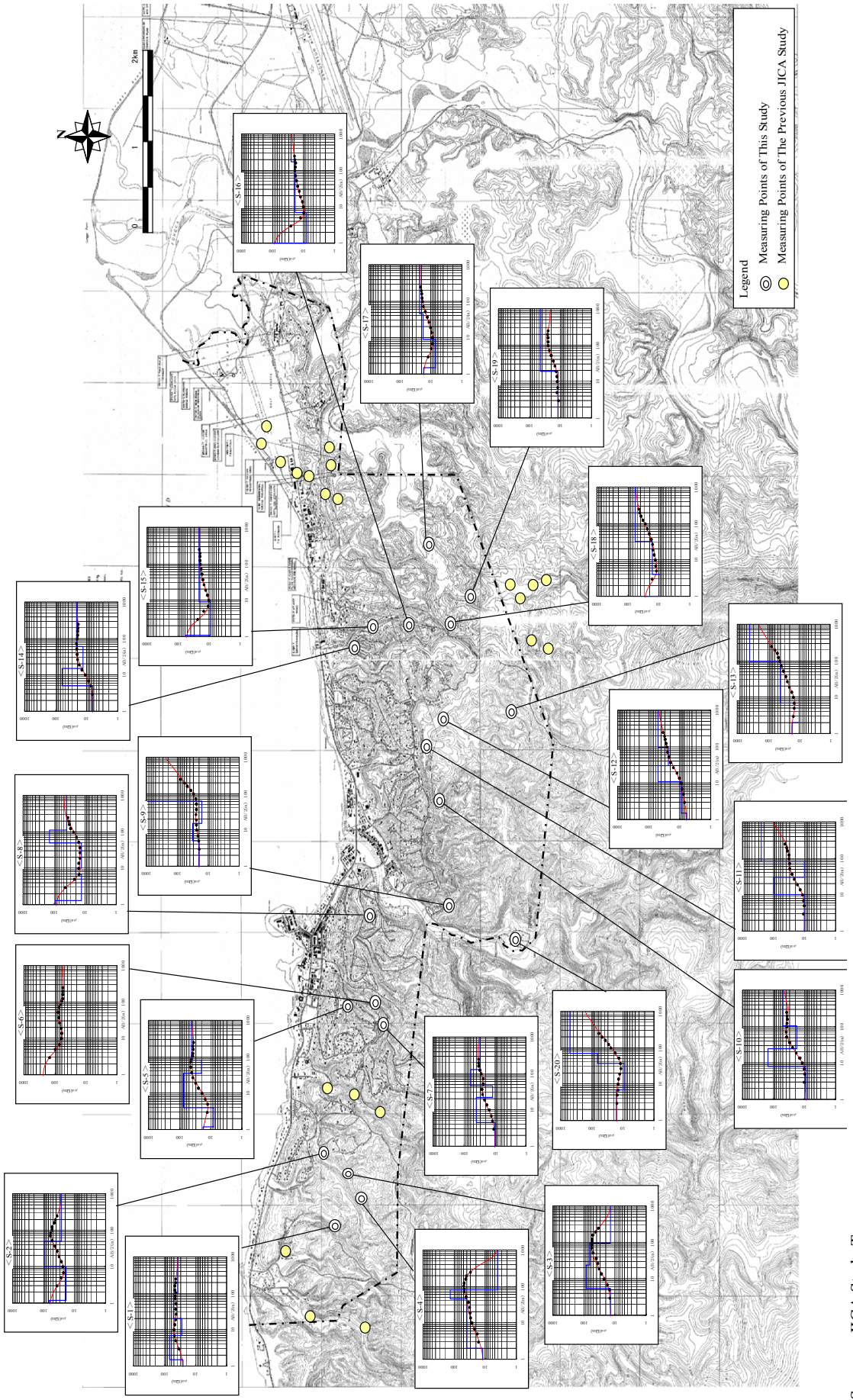
Source : JICA Study Team

Annex- 1 River Basin of Honiara Area



Annex- 2 Water Discharge Measurement Points of Surface Water and Spring in Honiara

Source : JICA Study Team



Annex- 3 Location of Geophysical Prospecting in Honiara

Source : JICA Study Team