NATIONAL PLANNING OFFICE
THE REPUBLIC OF VANUATU

BASIC DESIGN STUDY REPORT

ON

THE PROJECT FOR IMPROVEMENT OF WASTE DISPOSAL EQUIPMENT

IN

THE REPUBLIC OF VANUATU

MARCH 1996

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

PACIFIC CONSULTANTS INTERNATIONAL

BASIC DESIGN STUDY REPORT ON THE PROJECT FOR IMPROVEMENT OF WASTE DISPOSAL EQUIPMENT IN THE REPUBLIC OF VANUATU MARCH 1

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Preface

In response to a request from the Government of the Republic of Vanuatu the Government of Japan decided to conduct a basic design study on the Project for Improvement of Waste Disposal and entrusted the study to the Japan International Cooperation Agency (JICA).

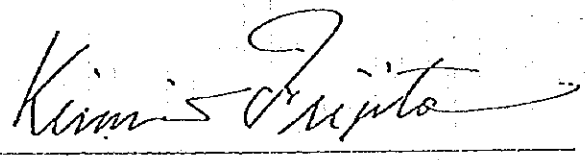
JICA sent to Vanuatu a study team from January 20 to February 10, 1996.

The team held discussions with the officials concerned of the Government of Vanuatu, and conducted a field study at the study area. After the team returned to Japan, further studies were made, and as this result, the present report was finalized.

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

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

March , 1996



Kimio Fujita
President
Japan International Cooperation Agency

March, 1996

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Waste Disposal in the Republic of Vanuatu.

This study was conducted by Pacific Consultants International, under a contract to JICA, during the period from January 16 to March 15, 1996. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Vanuatu and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

Finally, we hope that this report will contribute to further promotion of the Project.

Very truly yours,

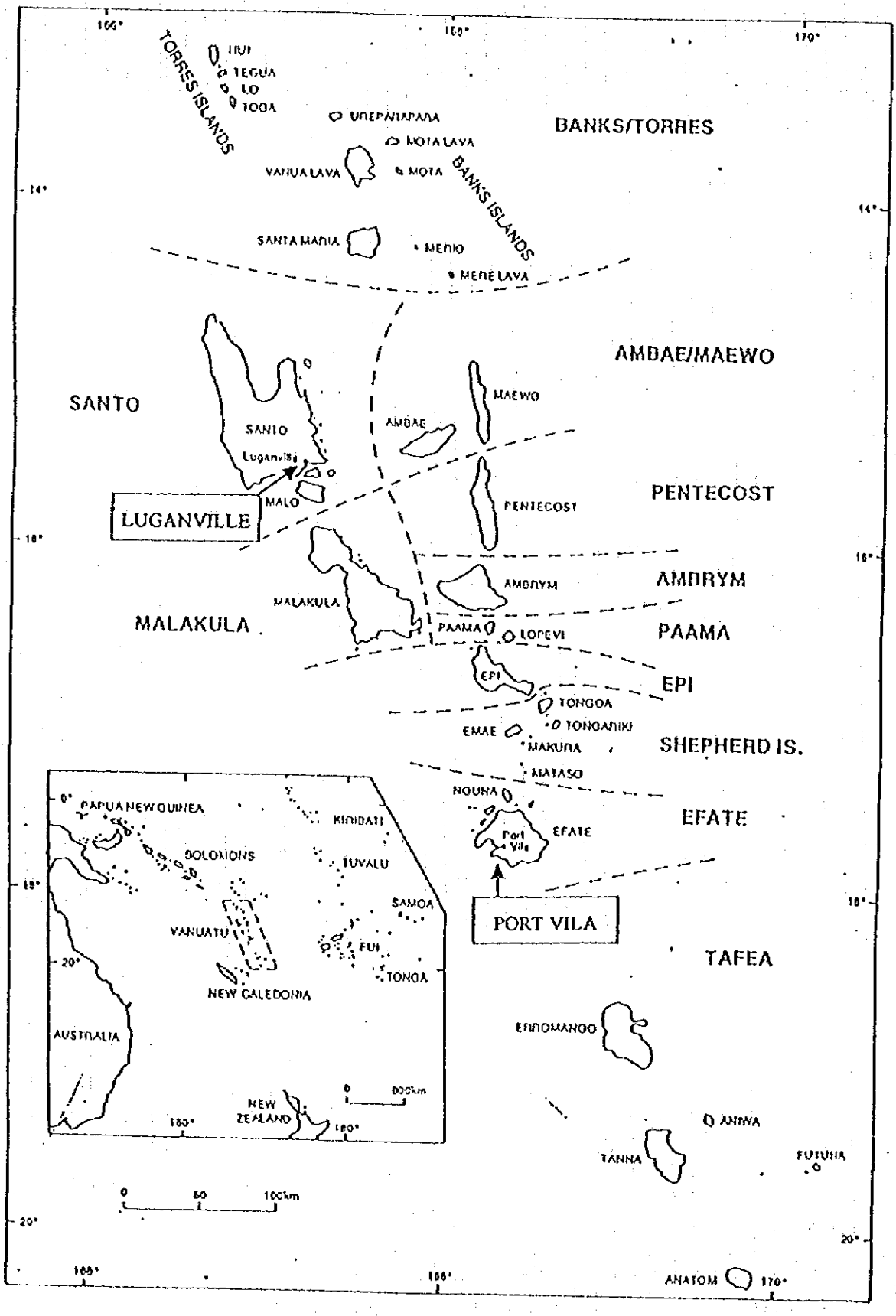
T. Ozawa

Terutoshi Ozawa

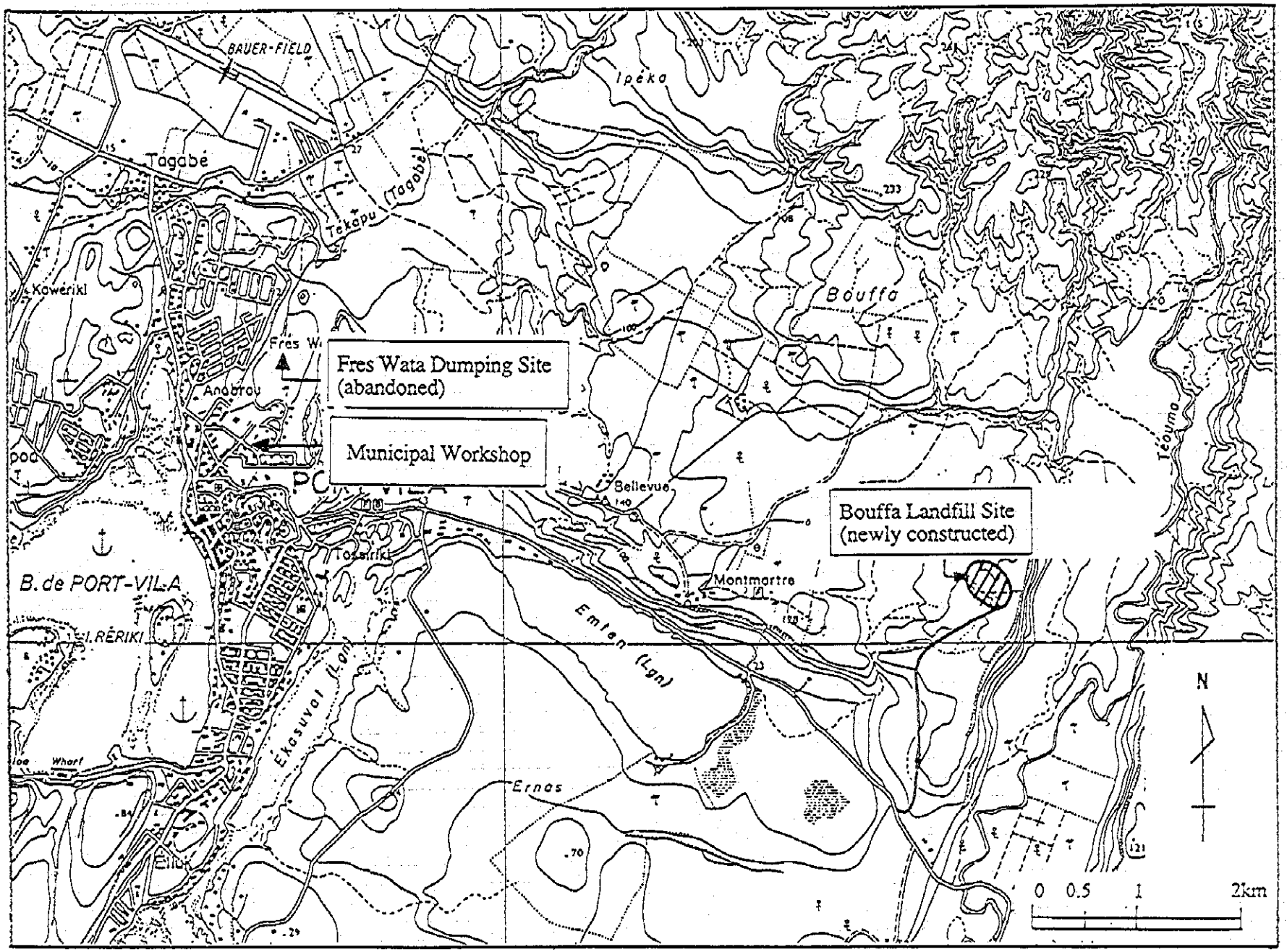
Project manager,

Basic design study team on
the Project for Improvement of Waste Disposal
in the Republic of Vanuatu

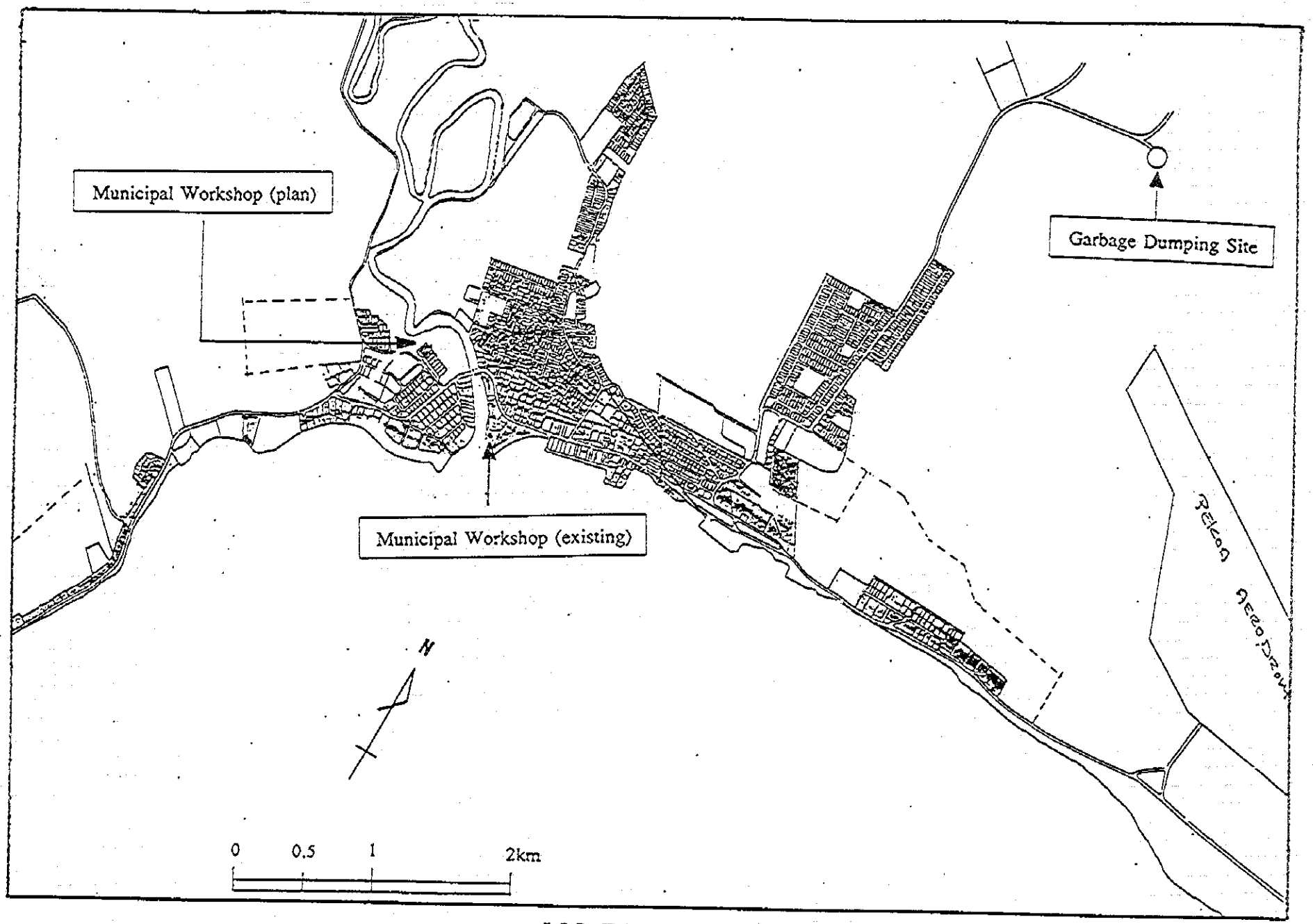
Pacific Consultants International



LOCATION MAP (VANUATU)



LOCATION MAP (PORT VILA)



LOCATION MAP (LUGANVILLE)

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Chapter 1 Background of the Project

Chapter 1 Background of the Project

The growth ratio of population of the entire Republic of Vanuatu was 2.8 % per year in average during the 10 year period from 1979 to 1989.

However, the urban areas showed a higher population, growth ratio of 7.5 % per year. Especially the growth ratio of the capital city, Port Vila, and Luganville, the second largest city, were 10.5 % and 7.0 % per year respectively.

In Port Vila, there exist squatter areas, that are beyond the jurisdiction of the Municipality and those areas are also expanding with the increase of population. The amount of waste disposal is also increasing in accordance with the increase in population. However, the capability of waste disposal treatment is declining due to insufficiency of collection and transportation capacity caused by a shortage and deterioration of waste collection and disposal equipment.

Consequently there occur numerous health and environmental problems. The refuse generated weekly in Port Vila in 1995 is estimated to be about 670 m^3. To collect and transport this waste, the Municipality has one dump truck, two dump trucks with container and two compactor type collection vehicles.

But, among them, the two compactor type collection vehicles are out of use at present, because of mechanical troubles and lack of spare parts. Moreover, it is considered to be impossible that they can be reused, taking their deterioration into consideration.

Therefore, solid waste generated in Port Vila is collected by the above three dump trucks at present and their capacity is insufficient to collect all the waste generated in Port Vila. The collection ratio of the waste is estimated to be 77 % at present.

In 1996 two collection vehicles (Dump trucks with containers) are scheduled to be purchased by the Government using a World Bank Loan. However, the capacity of the collection vehicles is still insufficient and the collection ratio in 1998 would be less than 100 % and, in 2001, it would be less than even 50 %.

On the other hand, branches and leaves of garden trees, so called green waste, which occupy one third of the total waste generation, particularly results in lowering the collection ratio. These green wastes cannot be put into refuse vessels and have to be loaded on the dump trucks manually. Consequently it often happens that they are left as they are beside the roads. Moreover, inside the squatter areas, where collection vehicles cannot enter easily, the waste is often uncollected, resulting in environmental and sanitation problems.

In Luganville, the refuse generation is estimated to be about 220 m^3 per week in 1995. To collect the above waste, the municipality has one dump truck and one compactor type collection vehicle. Waste collection rate is estimated to be 95 % at present. However, the compactor type collection vehicles, which has comparatively high capacity for collection, has become superannuated. The collection ratio will be less than 30 % in 1998 without any additional vehicles. Also, the generation ratio of green waste which cannot be put into collection vessels is high, similar to Port Vila. Therefore the green waste is often uncollected.

Under the above circumstances, the Government of the Republic of Vanuatu made a request for grant aid, for the procurement of the equipment for Improvement of Waste Disposal in Port Vila and Luganville, to the Government of Japan.

The major components of the request are as follows:

(1) Port Vila

Item No.	Description	Unit	Quantity
1.	Collection Vehicles	Unit	2
2.	Shredder (composting logs < 300 mm)	Unit	1
3.	Open Top Transfer Station Skips (10 m^3)	Unit	6
4.	Open Top Transfer Skips (3 m^3)	Unit	10
5.	Flat Bed Tipper Truck equipped with Skids and Loading Arm to handle Skips	Unit	1
6.	15 ton Tipper Truck with Grab Type Crane (3 ton SWL)	Unit	1
7.	Backhoe Loader (4WD) JCB 3CX or equivalent	Unit	1

(2) Luganville

Item No.	Description	Unit	Quantity
1.	Collection Vehicles	Unit	2
2.	10 ton tracked Loader	Unit	1
3.	15 ton Tipper Truck with Grab Type Crane (3 ton SWL)	Unit	1

Chapter 2 Contents of the Project

Chapter 2 Contents of the Project

2-1 Objectives of the Project

In Vanuatu, the people tends to concentrate to the capital, Port Vila, and the second largest city, Luganville, looking for the opportunity of employment, with the population growth rate increasing in the urban area. In particular, the annual average population growth rate of Port Vila is as high as 10.5 % and that of Luganville is also high at 7.0 %. The rapid growing population forms large number of squatter areas within the city of Port Vila, with the dense residential areas spreading beyond the municipal jurisdiction. In line with rapid growth of the population in urban areas, the amount of waste generated increases rapidly. But the improvement and construction of waste disposal system cannot cope with such rapid increase. Particularly, the waste collection and transport capacity is deteriorated due to deficient and obsolete equipment, worsening the urban environment.

Concerning the waste disposal, the government of the Republic of Vanuatu has made public the policy aiming at the economic growth and development based on consideration of the impact on the environment in its Third National Development Plan (1992 - 1996). The municipal authorities of Port Vila have decided to close the existing landfill site of solid waste within the residential area for reuse as a green space and a construction of a new disposal site in the Bouffa area in suburb. The new disposal site of sanitary landfill is almost completed at present with the loan from the World Bank. The Fourth National Development Plan starting in 1997 remains still conceptual, and the National Planning Office is considering incorporation of the general waste management plan and measures targeting at the year 2001, five years from now, as priority subjects for Port Vila and Luganville.

The objective of the Project is therefore to procure the waste disposal facilities appropriate to the amount and pattern of waste generation in both cities. The Project is focused mainly on the improvement and construction of the waste collection and transport system in line with above plans while aiming at achievement of the 100 % dust collection by the year 2001.

2-2 Basic Concept of the Project

The content and generation state of waste were confirmed and the operation state of existing equipment grasped for both Port Vila and Luganville. At the same time, the waste generation amount was projected for the future and the target year and facility level as assumed by the authorities of Vanuatu confirmed. With these factors taken into account, details, grade, quantity, and utilization plans of the equipment requested were confirmed.

2-2-1 Confirmation of the Request

Table 2-1 shows the equipment requested by the authorities of Vanuatu. The confirmed content and reason of the request are described below.

Table 2-1 Details of the Request of the Authorities of Vanuatu

[Port Vila]

Type	Quantity	Specifications
Collection vehicle	2	Closed container type dump truck
Shredder	1	(Capable of handling max. 300 mm logs)
Skip	6	Open top (10 m^3)
Skip	10	Open top (3 m^3)
Loading arm truck	1	With skid & loading arm
Truck with crane	1	3 t grab type, total weight 15 t
Backhoe loader	1	4WD, JCB 3CX

[Luganville]

Type	Quantity	Specifications
Collection vehicle	2	Closed container type dump truck
Truck loader	1	10 t
Truck with crane	1	3 t grab type, total weight 15 t

(1) Port Vila

Collection vehicles (2 units)

This is similar to the existing closed box type dump truck (Made in Japan) and dedicated for collection of general domestic waste, thereby increasing the total waste collection amount.

Shredder (1 unit)

This is used to reduce the volume of branches and leaves of garden trees, so-called green waste, by shredding them into small pieces, thereby improving the loading efficiency of collection vehicles. Inclusion of thick trees or branches in waste may make spreading and surface compaction in the landfill disposal site less effective, resulting in cavity inside the landfill and finally in cave-in. This problem can be solved by shredding them into small pieces beforehand to ensure that only shredded pieces are disposed of.

10 m^3 skips (6 units)

In the squatter area, houses are built so densely by ignoring the municipal building guiding standard that a collection vehicle can not enter the area. Accordingly, waste collection is not executed thoroughly in this area. In order to cope with the situation, skips (containers) are to be arranged on the roadside to allow the waste from the squatter area to concentrate totally to these skips. Each skip will be able to be loaded into transport vehicle. By transporting and disposing of waste in these skips with dedicated vehicle, the collection efficiency can be enhanced and no waste will be left uncollected. Six squatter areas of a relatively large size (population of 500 or more) will be provided with these 10 m^3 skips.

3 m^3 skips (10 units)

The purpose of the use of these skips is the same as for 10 m^3 skips. These will be provided to 10 densely populated squatter areas of relatively small size (population 200 - 500).

Loading arm truck (1 unit)

This is a truck with a function to load the skip as a whole of container and dedicated for a series of operations from loading of skips on the roadside, transporting to and disposal at the final disposal site, and return of skips to original positions. It is desirable that the truck can handle both 10 m^3 and 3 m^3 skips.

Truck with crane (1 unit)

Currently, wastes including green wastes, which are placed on the roadside without being housed in a container, are loaded manually onto a dump truck with high

bed. The operation efficiency is poor and some wastes are left unloaded. To improve the operation efficiency, it is necessary to mechanize the work portion which is currently executed manually. The truck with crane must be newly employed, which can grab the waste with a grab at an end of the crane to load it onto its own bed.

Backhoe loader (1 unit)

The only equipment currently available in the new final disposal site is the truck loader which performs principal operations of waste spreading, surface compaction, and soil cover. No working machinery convenient for miscellaneous works is available. A Backhoe loader used frequently for excavation of side ditches in Vanuatu is necessary to execute operations needed for sanitary landfilling, such as excavation of storm-water drainage ditch for appropriate storm-water drainage and suppression of leachate. This machine will also support a part of miscellaneous works (improvement and construction of the access road), waste spreading, and soil cover.

(2) Luganville

Collection vehicles (2 units)

These are closed box type dump trucks, the same as requested by Port Vila, and dedicated for collection of domestic waste to increase the total waste collection amount.

Truck loader (1 unit)

Currently, daily waste spreading and soil cover are not made in the final waste disposal site. Instead, waste spreading is made about once every 18 months by using a truck loader leased from a private constructor. The authorities made a request to possess a truck loader to enable daily waste spreading and soil cover about once a week.

Truck with crane (1 unit)

This is truck equipped with a crane having a grab on its end, the same as the authorities of Port Vila requested. This truck will be used to enhance the collection efficiency of waste placed without being housed in a container, such as green waste, on the roadside.

(3) Garage Construction Materials

In both Port Vila and Luganville, the spaces of the existing garages are limited and it is necessary to install new garages for some of the additional equipment. Garage construction materials were requested additionally by the Vanuatu side.

2-2-2 Study on the Details of the Request

Following confirmation of the request as above described, the content and generation state of waste were confirmed and the operation state of existing equipment grasped for both Port Vila and Luganville. At the same time, the waste generation amount was projected for the future and the target year and facility level as assumed by the authorities of Vanuatu were confirmed. On the basis of factors thus confirmed, the details and quantity of the necessary equipment were studied.

(1) Port Vila

Collection vehicles (2 units)

The compactor vehicle is superior in terms of both collection and operation efficiencies. Considering however that existing compactor vehicles are nearly inoperative because of lack of repair parts, the closed box type dump truck as requested by the authorities of Vanuatu may prove appropriate to Port Vila because it has less hydraulic parts and the operators are more familiar with operation and maintenance with the existing ones. Note however that the existing vehicle has a high waste loading position, with poor operability, and this drawback need to be improved.

Shredder (1 unit)

Green waste contains wet leaves and grasses more than wood, which makes the shredding efficiency with the shredder unsatisfactory. Besides, screening is necessary before loading in order to prevent mixing of foreign materials such as wires, etc., resulting in the necessity of arranging dedicated workers. In addition, mixing of thick trunks or branches is less frequent. Considering all these factors, it may not be necessary to have the shredder on hand.

Skips, 10 m^3 (6 units)

The combination of skips proper and a loading and transport vehicles was studied.

The procurement cost of the vehicle handling both 8 m^3 and 4 m^3 skips is lower than that for both 10 m^3 and 3 m^3 skips.

From the economical point of view, it is more desirable to use the standard type of handling both 8 m^3 and 4 m^3 skips.

The applicable large skip is of a 8 m^3 type.

Skips, 3 m^3 (10 units)

Because of reasons as described for large skips, it is desirable to employ 4 m^3 small skips. Concerning the total waste disposable capacity, this change may cause decrease in the total volume of 16 units of large and small skips from 90 m^3 to 88 m^3, but its impact on the whole of the improvement and construction plan is estimated to be null.

Loading arm truck (1 unit)

A vehicle which, as a single unit, can handle both large and small skips is essential in order to ensure the rational use of skips and not to worsen the waste disposal budget by unnecessary increase in manpower.

Truck with crane (1 unit)

Green waste, which is one of the characteristic of dust generated in Vanuatu, is not collected thoroughly. Considering such present state, the optimum measure to enhance the collection ratio while minimizing the increase in the manpower and equipment is to enhance the operation efficiency. In this respect, the truck with crane is considered to be the appropriate equipment.

Backhoe loader (1 unit)

The new final waste disposal site is of a sanitary landfill type. Though the facility is satisfactory, the fact is that only one truck loader is available for the management of the site, with only the limited type of operation possible with this loader. A Backhoe is enough if only excavation of storm-water drainage ditch is

necessary. Considering the necessity that it has to perform other miscellaneous works or a part of waste spreading and soil cover, the vehicle equipped with loader must be provided as requested. In Vanuatu, this type of vehicles is used widely because of its versatility and may prove applicable there thanks to the familiarity with the operation and maintenance.

Note that this vehicle is to be used normally in the waste disposal site and thus should be stored there. However, a new garage must be constructed because the existing one allows parking of only the existing truck loader.

(2) Luganville

Collection vehicles (2 units)

Waste to be generated from the population of 12,500 in the future (the year 2001) is estimated to be 280 m^3/week. Similar to the case of Port Vila, such waste is considered to be collectable with two collection vehicles and no other collection and transport equipment is necessary. When considering the situation from a viewpoint of the waste generation pattern, this type of collection vehicles suffers in respect of the collection efficiency of green waste. Therefore, the collection system with one collection vehicle and one truck with crane will prove more efficient.

Judging from the collection capacity of a truck with crane, it would be enough for the collection vehicle to have the loading capacity of 7 m^3.

Since the existing garage allows storage of the existing equipment and is obsolete, a new garage is necessary to store the new equipment.

Truck loader (1 unit)

Though waste spreading is made only semi-annually at present, there are less problems of waste scattering, offensive odor, and flies and no claim has been presented from residents in the surrounding area. If soil cover is to be made, the whole amount of cover soil must be purchased, which the budget can not cover, because the site is located in the old quarry. Moreover, assuming that the city authorities possess the truck loader, it will be the first equipment ever experienced by the city authorities. This means that considerable trouble and time may be necessary for familiarization with its operation and maintenance. Considering all of these factors, there is no urgent necessity as of present that the city authorities

has the truck loader. Besides, the cost effect when the vehicle is purchased is low. In consequence, the conventional way of using a truck loader leased as required will be enough.

Truck with crane (1 unit)

As described concerning collection vehicles, this is appropriate for collection of green waste. When combined with collection vehicles, the truck with crane may achieve collection appropriate to the waste generation pattern.

(3) Garages for New Equipment

Since the existing garages in Port Vila and Luganville have limited spaces for the existing vehicles, new garages, a garage for the backhoe loader in Port Vila and a garage for the collection vehicle and the truck with crane in Luganville, are necessary.

2-2-3 Basic Concept

On the basis of above study, the basic concept of the Project was determined to consist of collection of the whole waste generated from the projected population of 42,000 (Port Vila) and 12,500 (Luganville) for the year 2001 in order to improve the urban environment in principal cities of the Republic of Vanuatu. In this case, the unique characteristics there, that is, mixing of large amount of branches and leaves of garden trees, were taken into account. Also, the garage construction materials for both cities were included.

2-3 Basic Design

2-3-1 Design Concept

(1) Policy Concerning Natural Conditions

i) Waste Disposal Equipment

The weather of the Republic of Vanuatu is high in temperature and humidity, with large rainfall. Both Port Vila and Luganville face the sea and the road along the coast is readily affected by the sea (saline) water.

In both cities, the surface condition of the road to the final disposal site is satisfactory, but the roads used for collection of waste within the urban area have poor surface condition. Most of roads in Luganville are not paved.

Accordingly, the durability and corrosion resistance (coating) must be essential points to be considered for selection of the equipment and determination of the specifications.

ii) Materials for Construction of Garages

Garages for the vehicles will be of a simple construction as much as possible with reference made to existing garages and with economical efficiency taken into account. In consideration of the gust caused by cyclone, the feasibility of an open ceiling construction will be studied.

(2) Policy Concerning Procurement Conditions

Local procurement of the equipment is impossible. The equipment to be selected must be the one for which any spare parts can be obtained easily within a short period via an agency in Vanuatu or in neighboring countries.

(3) Policy Concerning the Maintenance/Management Capacity of the Authorities

i) Operation and maintenance/nanagement of the equipment are made by Port Vila and Luganville municipal authorities. Since the manpower and budget available in both cities are limited, the fuel economy and easiness of operation/service must be taken into account for selection of the type and specifications.

ii) The vehicle design must be based on the operability; for example, lowering of the waste loading height of collection vehicles.

2-3-2 Basic Design

(1) Equipment Plan

In Port Vila and Luganville, the prediction of solid waste collection rate for ten years (from 1995 to 2004) was conducted.

The collection rates were calculated based on the quantity of waste generation and the capacity of waste collection by the existing equipment, equipment purchased under World Bank Loan and equipment by Japan's grant.

The numbers and the capacity of vehicles by Japan's grant were determined so that the collection rate in the year 2001 would be 100 %.

The results are shown in Table 2-2 and Table 2-3.

The basis of this study are as follows.

1) Population

The population in both cities in each year was provided by the National Statistics Office.

2) Solid waste generation

Waste generation per capita per day (U) and the density (d) were estimated based on the planned value of the other project and the actual measurement value in Fiji, because there was no measurement value in Vanuatu.

3) Trips per week

The trips per week of each collection vehicle were determined based on the manpower (present and future) and the numbers of vehicles,

4) Work efficiency

Work efficiency of each vehicle was determined considering the period used and frequency of maintenance.

(2) Table 2-4 summarizes the details, specifications, and purpose of vehicles of this project while Fig. 2-1 shows the outline of vehicles.

Table 2-2 PREDICTION OF SOLID WASTE COLLECTION RATE

PORT VILA

ITEM	Quantity	Trips/Week	Year									
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
POPULATION			30,000	31,800	33,700	35,900	38,100	40,000	42,000	44,100	46,400	48,900
WASTE GENERATION (m³/week)			672	712	755	804	853	896	941	988	1,039	1,095
U (kg/capita/day) =	0.8											
d (tons/m³) =	0.25											
CAPACITY OF WASTE COLLECTION (m³/week)												
(1) Existing Equipment												
1) Dump Truck (13 m³)	1	17	199	199	188	188	177	155	133	111	0	0
W.E. (Work Efficiency)			0.90	0.90	0.85	0.85	0.80	0.70	0.60	0.50	0.00	0.00
2) Dump Truck with Container (11 m³)	2	17	318	262	224	187	0	0	0	0	0	0
W.E.			0.85	0.70	0.60	0.50	0.00	0.00	0.00	0.00	0.00	0.00
3) Compactor Truck (6 m³)	1	0	0	0	0	0	0	0	0	0	0	0
W.E.			0.60	0.60	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4) Compactor Truck (8 m³)	1	0	0	0	0	0	0	0	0	0	0	0
W.E.			0.70	0.60	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total			517	461	412	375	177	155	133	111	0	0
(2) Equipment purchased under the World Bank Loan												
1) Dump Truck with Container (11 m³)	2	17	0	355	355	355	355	337	318	262	224	187
W.E.				0.95	0.95	0.95	0.95	0.90	0.85	0.70	0.60	0.50
(3) Equipment by Japan's grant												
1) Dump Truck (11 m³)	2	17	0	0	355	355	355	337	318	299	281	262
W.E.					0.95	0.95	0.95	0.90	0.85	0.80	0.75	0.70
2) Open Top Skip (8 m³)	6	2	0	0	91	86	77	67	58	48	0	0
W.E.					0.95	0.90	0.80	0.70	0.60	0.50	0.00	0.00
3) Open Top Skip (4 m³)	10	2	0	0	76	72	64	56	48	40	0	0
W.E					0.95	0.90	0.80	0.70	0.60	0.50	0.00	0.00
4) Tipper Truck with Grab Crane (10 m³)	1	17	0	0	162	162	162	153	145	136	128	119
W.E.					0.95	0.95	0.95	0.90	0.85	0.80	0.75	0.70
Sub Total			0	0	685	675	658	613	568	523	408	381
TOTAL			517	816	1,452	1,405	1,190	1,104	1,019	896	632	568
COLLECTION RATE (%)			76.9	114.6	192.3	174.8	139.4	123.2	108.3	90.7	60.8	51.8

Table 2-3 PREDICTION OF SOLID WASTE COLLECTION RATE

LUGANVILLE

ITEM	Quantity	Trips/Week	Year									
			1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
POPULATION			9,600	10,100	10,600	11,100	11,500	12,000	12,500	13,100	13,500	14,100
WASTE GENERATION (m^3/week)			215	226	237	249	258	269	280	293	302	316
U (kg/capita/day) =	0.8											
d (tons/m^3) =	0.25											
CAPACITY OF WASTE COLLECTION (m^3/week)												
(1) Existing Equipment												
1) Dump Truck (10 m^3)	1	10	90	80	70	70	70	60	50	0	0	0
W.E. (Work Efficiency)			0.90	0.80	0.70	0.70	0.70	0.60	0.50	0.00	0.00	0.00
2) Compactor Truck (6 m^3)	1	16	115	115	96	0	0	0	0	0	0	0
W.E.			0.60	0.60	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sub Total			205	195	166	70	70	60	50	0	0	0
(2) Equipment by Japan's grant												
1) Dump Truck (7 m^3)	1	16	0	0	106	106	106	106	101	101	95	90
W.E.					0.95	0.95	0.95	0.95	0.90	0.90	0.85	0.80
2) Tipper Truck with Grab Crane (10 m^3)	1	16	0	0	152	152	152	152	144	144	136	128
W.E.					0.95	0.95	0.95	0.95	0.90	0.90	0.85	0.80
Sub Total			0	0	258	258	258	258	245	245	231	218
TOTAL			205	195	424	328	328	318	295	245	231	218
COLLECTION RATE (%)			95.4	86.3	178.7	132.1	127.5	118.5	105.3	83.4	76.5	68.9

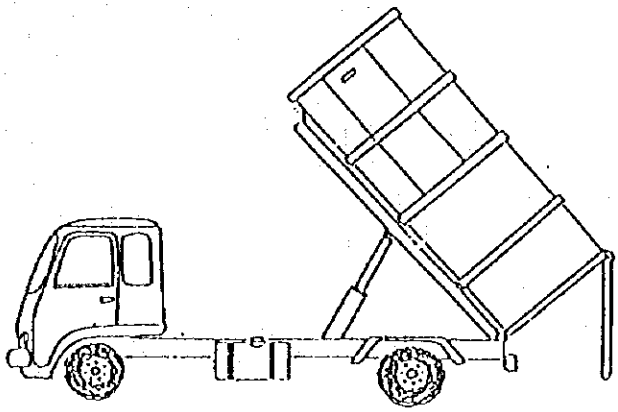
Table 2-4 Basic Design of the Equipment

[Port Vila]

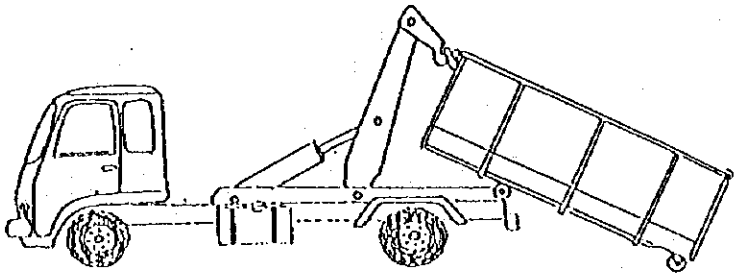
	No.	Equipment	Quantity (Unit)	Specifications			Purpose
				Spec.	Gross Weight (t)	Loading Capacity (m^3)	
	1.	Collection vehicle	2	Closed box type dump truck	12	11	Collection and transport of general waste
	2.	Skip (container)	6	Open top, with one rear door	-	8	Waste collection in densely housed area (population of 500 or more)
	3.	Skip (container)	10	Open top, with one rear door	-	4	Waste collection in densely housed area (population of 200 ~ 500)
	4.	Loading arm truck	1	With skip loading arm	10	4, 8	Loading and transport of skips
	5.	Truck with crane	1	Deep-bottom dump truck with folding crane having orange grab	14	10	Collection and transport of branches and leaves of garden trees
	6.	Backhoe loader	1	Bucket capacity 1 m^3 (front), 0.2 m^3 (Backhoe), 4WD	7	-	Improvement and construction of storm-water drainage ditch and the service road, and miscellaneous works in the final disposal site
	7.	Garage construction materials	1 set	Steel frame construction	-	-	Garage for Backhoe loader

[Luganville]

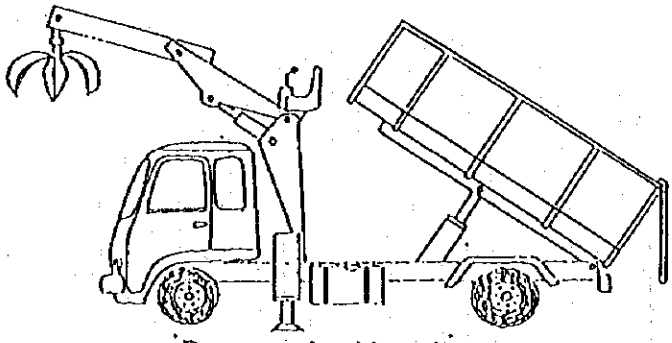
	No.	Equipment	Quantity (Unit)	Specifications			Purpose
				Spec.	Gross Weight (t)	Loading Capacity (m^3)	
	1.	Collection vehicle	1	Closed box type dump truck	10	7	Collection and transport of general waste
	2.	Truck with crane	1	Deep-bottom dump truck with folding crane having orange grab	14	10	Collection and transport of branches and leaves of garden trees
	3.	Garage construction materials	1 set	Steel frame construction	-	-	Garage for collection vehicle and truck with crane



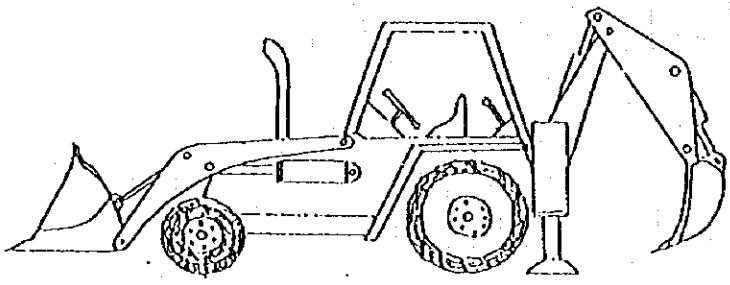
Collection vehicle (dump truck with closed container)



Skip truck (with loading arm)



Dump truck with grab crane



Backhoe loader

Fig. 2-1 Outline of Vehicles for the Project

Chapter 3 Implementation Plan

Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Concept

(1) Implementation Organization

In case that this project is implemented by the Japanese Grant Aid, this Project will be implemented in compliance with conditions described in E/N exchanged between the Government of the Republic of Vanuatu and the Government of Japan. The implementation organizations of the Project of the Vanuatu side are the National Planning Office as a competent organization in charge of control of the Project as a whole and the Department of Provincial Affairs, Ministry of Home Affairs, as a practical implementation organization of the Project.

The National Planning Office employs a Japanese consultant to conduct the engineering services for implementation, including detailed design, preparation of tender documents, assistance to the National Planning Office concerning bidding, and execution and management of procurement of materials and equipment.

The National Planning Office selects the Japanese contractor to cause him to procure the equipment for implementation of the Project through bidding according to the guideline of the Japanese Grant Aid System.

(2) Bid and Contract Manner

Procurement of the equipment for this Project will be made by the contractor of Japanese nationality.

(3) Obligations of the Vanuatu Side

To ensure smooth and efficient implementation of the Project, the authorities of Vanuatu must put into practice its obligations associated with procurement of equipment. Obligations to be executed by the Vanuatu authorities are described later.

Implementation of the Project is considered extremely significant because the Project will contribute to improvement of the environmental and hygiene of both cities. For achievement of the objectives of the Project, however, appropriate

maintenance and management of waste collection equipment are of vital importance.

In this context, the authorities concerned of the Republic of Vanuatu must put following matters into practice without fail.

1) Thorough maintenance and management of equipment procured for this Project, along with existing ones. Preparation of budget and arrangement of manpower necessary for such maintenance and management.

2) In both Port Vila and Luganville, minor repair of newly procured vehicles can be executed in the existing service shop owned by the city authority. However, major repair is difficult because of deficiency in talents and repair equipment. It is therefore essential to set up a repair system in which any major repair can be requested to the Public Works Office's service shop well equipped with equipment and manpower. The government of the Republic of Vanuatu must take the measures necessary to implement such system.

3) Garages are necessary to house new vehicles; for one Backhoe loader in Port Vila and for two vehicles in Luganville. Acquisition of the land and leveling of ground must be made for construction of these garages.

3-1-2 Implementation Conditions

Garages are necessary to house new vehicles; for one Backhoe loader in Port Vila and for two vehicles in Luganville. Acquisition of the land, leveling of ground, and foundation work must be completed before arrival of vehicles in these cities.

3-1-3 Scope of Works

When this Project is implemented, the scope of works of Japan and Vanuatu is as shown in the table below.

Item	Japan	Vanuatu
Acquisition of land for garage (2 locations)		O
Leveling of ground for garage (2 locations)		O
Procurement of waste disposal equipment	O	
Procurement of garage construction materials	O	
Assembly and installation of garage	O	

3-1-4 Consultant Supervision

If this Project is implemented in compliance with the grant assistance of Japan, the authorities of Vanuatu will conclude a contract with a consultant recommended by JICA and the consultant will perform the implementation design and consultant supervision.

(1) Implementation Design

The implementation design involves detail designing, preparation of tender documents, and preparation of documents necessary for implementation of the Project.

(2) Bidding

The consultant will assist the National Planning Office to ensure the fair bidding in the witness of JICA. The contract to be concluded between the authorities of Vanuatu and contractor after bidding will become effective upon approval of the government of Japan.

(3) Consultant Supervision

The consultant will assist the National Planning Office while conducting the guidance and supervision of the contractor concerning mainly process and quality controls for manufacture of equipment, intermediate and before-shipment inspections, transport of equipment, acceptance, delivery, and construction of garages, ensuring completion of the Project within the time period stipulated in E/N.

3-1-5 Procurement Plan

The suppliers of equipment are as listed in the table below.

Vehicles	Supplier	
	Japan	OECD members except Japan
Collection vehicles (11 m³)	O	
Collection vehicles (7 m³)	O	
Skip (8 m³)	O	
Skip (4 m³)	O	
Loading arm truck	O	
Truck with crane	O	
Backhoe loader		O
Garage construction materials	O	

The materials for Port Vila will be unloaded at the Port Vila harbor and those for Luganville at the Luganville harbor.

All equipment except garage construction materials will be delivered to Vanuatu side at the harbors unloaded. The final destinations of the garage construction materials, for which the inland transportations are required, are the final disposal site about 10 km distance from the harbor in Port Vila and the municipal yard about 3 km distance from the harbor in Luganville.

3-1-6 Implementation Schedule

The implementation schedule is as shown in Table 3-1. The entire schedule is 11 months from the date of conclusion of E/N, including four months from E/N to the contract with contractor. The delivery date will be the end of March, 1997.

3-1-7 Obligations of the Republic of Vanuatu

Obligations of the Republic of Vanuatu for implementation of this Project are described below:

(1) Scope of works in 3.1.3

(2) Payment of the commission in compliance with the agreement with a bank

(3) Smooth unloading, tax exemption, and customs procedure for entry of material and equipment procured for this Project into Vanuatu, and smooth inland transport

(4) Measures necessary for entry and stay of the Japanese concerned for execution of duties, who are related to procurement and service of materials and equipment under the approved contract

(5) Exemption of taxes, such as customs duty, internal tax, and others, for the Japanese concerned related to procurement and service of materials and equipment under the approved contract

(6) Granting of approvals and permissions necessary for implementation of the Project

(7) Appropriate and effective maintenance and management of equipment procured under grant assistance of Japan

(8) Bearing of all expenses which are necessary for procurement of equipment, but which can not be born by the grant assistance of Japan

(9) Measures of authorities concerned of Vanuatu which are necessary for speed-up of various procedures to ensure smooth implementation of the Project

3-2 Operation and Maintenance Plan

In order to establish the operation and maintenance plan for equipment procured during implementation of the Project, clarification of details as well as the required manpower and expenses for operation and maintenance are necessary. These items are described below.

(1) Required Manpower

For operation of the equipment newly procured during this Project, the manpower must be increased as follows to obtain the staff for equipment operation and waste disposal:

Port Vila

Collection vehicles (2 units)	:	Two drivers, four workers
Loading arm truck (1 unit)	:	One driver
Truck with crane (1 unit)	:	One driver, one worker
Backhoe loader (1 unit)	:	one driver

Luganville

Collection vehicle (1 unit)	:	One driver, two workers
Truck with crane (1 unit)	:	One driver, one worker

(2) Required Expenses

Increase in the personnel expenses caused by increase in the manpower will be 2,924 thousand vatu/year for Port Vila and 1,433 thousand vatu/year for Luganville. As of present (1995), these represent respectively 14 % (Port Vila) and 27 % (Luganville) of the waste disposal budget.

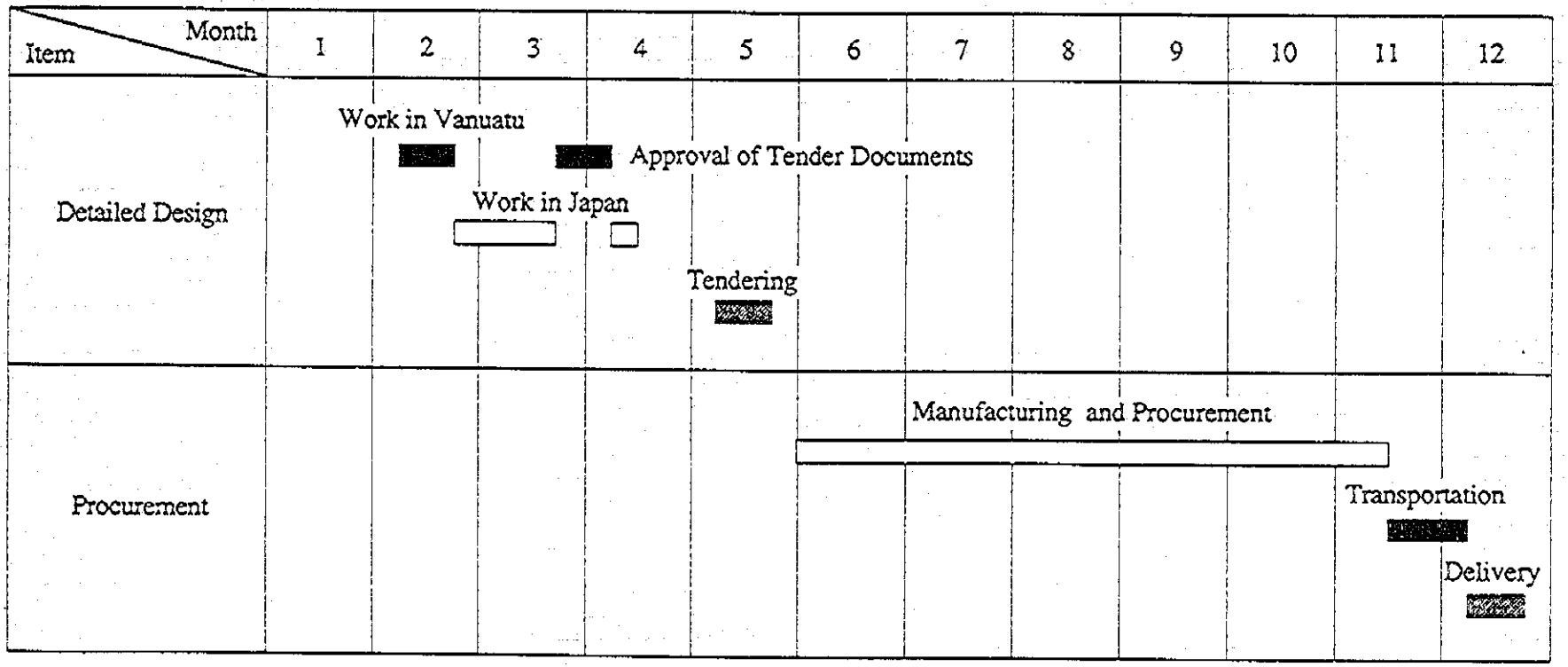
The sole increase component of the equipment operation and maintenance expenses is the fuel cost for the time being, which amounts to 2,393.2 thousand vatu/year for Port Vila and 332.3 thousand vatu/year for Luganville. As of

present (1995), these represent respectively 12 % (Port Vila) and 6 % (Luganville) of the waste disposal budget.

The new equipment may have to be renewed in about ten years when the operating conditions (mileage, etc.) are considered.

The authorities of Vanuatu plan to increase the tax revenue by improving the system of taxation and by collecting the land price tax efficiently (the tax conventionally uncollected from squatters). The authorities of both cities plan to cope with the increase in the operation and maintenance expenses related to procurement of new equipment by increasing the waste disposal budget through increase in the tax revenue.

Table 3-1 Implementation Schedule



Chapter 4 Project Evaluation and Recommendation

Chapter 4 Project Evaluation and Recommendation

4-1 Project Effect

For both Port Vila and Luganville, the details and generation state of wastes were checked and the operation state of existing facilities grasped. At the same time, the future waste generation amount was projected by using the waste generation unit of 0.8 kg/person/day and the density before compaction of 0.25 t/m^3 while considering into account the mixing of large amount of green waste. Apart from the prediction of the collection ratio when the necessary equipment including existing ones would be introduced to achieve the target, the future collection ratio when this Project would not be implemented was also predicted.

It is predicted that the waste collection capacity of Port Vila which is currently estimated to be around 77 % will drop below 50 % in the year 2001 due to obsolete equipment even when the equipment to be procured with the loan from the World Bank is taken into account. However, with implementation of the Project, the waste collection ratio will be increased to 100 % in the year 2001.

It is predicted that the waste collection capacity of Luganville which is currently estimated to be around 95 % will drop below 20 % in the year 2001 due to obsolete equipment. However, with implementation of the Project, the waste collection ratio will be increased to 100 % in the year 2001.

By achieving the 100 % collection ratio in both Port Vila and Luganville, all of wastes that are currently left on road can be collected and disposed of. This in turn will help preventing worsening of the urban environment due to rapid growth of the population.

Not only the gross collectable amount increases, but also waste collection the squatter area becomes easier by the use of skips (containers). In addition, the truck with grab crane will enable easy collection of branches and leaves of garden trees, waste characteristic of Vanuatu. In this manner, the operation efficiency can be enhanced by introducing the equipment appropriate to the waste generation pattern.

In the final disposal site of Port Vila, only one truck loader is operating and such minor operation as storm-water drainage, etc. can not be made at present. With the Backhoe loader put into operation in the site, the ditch appropriate to prevent entry of storm water into the landfill can be excavated, thereby preventing the problem of leachate.

Prevention of worsening of the urban environment not only helps the growing urban population keeping the healthy and comfortable life, but also contributes to promotion of sightseeing, the important industry of the Republic of Vanuatu.

In this manner, the improvement and construction of the waste disposal system in the urban area through implementation of the Project will greatly contribute to improvement of the life of residents. Contribution of the Project to maintenance and improvement of the urban environment while coping with rapid increase of the urban population is extremely great, with considerably high beneficiary effect.

Judging form the degree of effect, the nature of the Project, and practicability of the Project operation and management as described below, implementation of the Project on the basis of grant assistance is considered reasonable:

(1) The object which obtains benefit from the Project is the general urban residents including the poor. The beneficiary population by this Project is large; about 23,400 (56 % of the total population of the city) of Port Vila and about 10,400 (83 % of the total population of the city) of Luganville.

(2) The objective of the Project is to improve the sanitary and living environment of principal cities of Vanuatu, which is expected to become worse rapidly in line with rapid growth of the urban population at a rate as high as annual 7 - 10 %. The implementation of the Project is extremely urgent.

(3) This plan can be maintained, managed, and operated by the fund and talents, technology of Vanuatu.

(4) The integrated waste management plan is one of priority subjects in the next Five Year Plan (the Fourth National Development Plan) of Vanuatu. This Project will contribute to achievement of targets of this national plan.

(5) This Project has a main objective of improving the sanitary and living environment of the general urban residents including the poor and is not profitable.

(6) The original objective of the Project is the environmental improvement and no adverse impact on the environment is expected when the Project is implemented.

(7) This Project can be implemented without particular difficulty on the basis of the grant assistance of Japan.

4-2 Recommendation

In addition to substantial effect expected as described above, this Project will contribute greatly to improvement of the living environment of urban residents. It is judged that implementation of the Project based on our grant assistance is extremely meaningful. However, smooth operation of the plan will become difficult if following points are not considered:

(1) In both Port Vila and Luganville, the existing waste disposal system is not enough. In particular, no report is made concerning the state of collection, disposal, equipment operation and maintenance, resulting in lack of basic records. Operation and management of waste disposal works as well as maintenance and management of waste disposal equipment are considered not efficient. It is necessary therefore to keep the records containing the waste collection and disposal state, equipment operation state, such as a daily work report, equipment service/inspection report, etc.

Preparation of the daily work report will enable monitoring of the waste collection and disposal state, thereby enabling drafting and review of the rational and appropriate collection and disposal plan.

(2) In Vanuatu, repair parts are not stocked in most of cases and it is quite common to take several months from ordering of parts to actual delivery. Though it is not easy to improve the situation, decrease in the utilization factor of equipment due to long down time can be prevented by executing the preventive maintenance against failure.

In other words, instead of ordering the repair parts when the failure actually occurs, the service team must order necessary repair parts in advance while considering the required time. For this purpose, the repair policy must be established by predicting and determining the next repair details on the basis of inspection and adjustment using the check list during periodical inspection. Basically, the inspection and measurement must be made according to the check list by the mileage, which is supplied together with a vehicle, and the daily inspection, request for repair, repair report, vehicle history, parts slip must be formulated to accumulate data. In this manner, the repair time including the down time can be greatly shortened, with the utilization factor of equipment enhanced as well. Besides, the budget of the expenses necessary for repair can also be easily planned.

(3) The government of Vanuatu must conduct coordination among authorities concerned so that any major repair beyond the capacity of the service shop of both cities can be made by the Public Works Office's service shop in both cities.

Appendices

Appendices

1. Members of the Study Team

Mr. K. KITAZAWA	Leader	Director First Project Management Division, Grant Aid Project Management Department, JICA
Mr. Y. KANEKO	Technical Adviser	Chief Researcher Japan Waste Research Foundation
Mr. T. OZAWA	Chief Consultant	Pacific Consultants International
Mr. M. MURATA	Waste Collection and Transportation Planner	Pacific Consultants International
Mr. T. KURIHARA	Land Filling Planner	Pacific Consultants International
Mr. K. ANDO	Interpreter	Pacific Consultants International

2. Survey Schedule

Day	Date		Activities	
			(Kitazawa and Kaneko)	(Ozawa, Murata, Kurihara and Ando)
1	Jan. 20, 1996	Sat.		Leave Tokyo for Vanuatu
2	Jan. 21, 1996	Sun.		Arrive in Port Vila
3	Jan. 22, 1996	Mon.		Courtesy call on Ministry of Foreign Affairs, National Planning Office, Ministry of Home Affairs and Port Vila Municipality, and discussions
4	Jan. 23, 1996	Tue.		Site survey (Port Vila)
5	Jan. 24, 1996	Wed.		Site survey (Port Vila) and discussions with Public Works Department and Ministry of Home Affairs
6	Jan. 25, 1996	Thu.		Discussions with National Planning Office, ADB and Port Vila Municipality
7	Jan. 26, 1996	Fri.		Port Vila → Luganville, Courtesy call on Luganville Municipality, and discussions
8	Jan. 27, 1996	Sat.		Site survey (Luganville)
9	Jan. 28, 1996	Sun.		Site survey (Luganville)
10	Jan. 29, 1996	Mon.		Site survey (Luganville)
11	Jan. 30, 1996	Tue.	Leave Tokyo for Vanuatu	Site survey (Luganville)
12	Jan. 31, 1996	Wed.	Arrive in Port Vila, Port Vila → Luganville	Site survey and discussion with Luganville Municipality
13	Feb. 1, 1996	Thu.	Courtesy call at Luganville Municipality, discussions and site survey	
14	Feb. 2, 1996	Fri.	Luganville → Port Vila, Courtesy call on Ministry of Foreign Affairs, National Planning Office and Port Vila Municipality, and site survey	
15	Feb. 3, 1996	Sat.	Site survey (Port Vila)	
16	Feb. 4, 1996	Sun.	Data check	
17	Feb. 5, 1996	Mon.	Discussions with National Planning Office, Public Works Department, Port Vila Municipality and ADB	
18	Feb. 6, 1996	Tue.	Discussions on Minutes of Meeting	
19	Feb. 7, 1996	Wed.	Signing of Minutes of Discussions	Leave Port Vila for Japan
20	Feb. 8, 1996	Thu.	Leave Port Vila for Fiji	Arrive in Tokyo
21	Feb. 9, 1996	Fri.	Nadi → Suva Report the results of field survey to Embassy of Japan and JICA Fiji Office, Leave Fiji for Japan	
22	Feb. 10, 1996	Sat.	Arrive in Tokyo	

Day	Date		Activities	
			(Kitazawa and Kaneko)	(Ozawa, Murata, Kurihara and Ando)
21	Feb. 9, 1996	Fri.	Nadi → Suva Report the results of field survey to Embassy of Japan and JICA Fiji Office, Leave Fiji for Japan	
22	Feb. 10, 1996	Sat.	Arrive in Tokyo	

3. List of Party Concerned in the Republic of Vanuatu

Ministry of Foreign Affairs

Maseng Afred	Minister
Malere Raymond	First Secretary
Cevuard Jean	Second Secretary
Wiclif Ulas	Third Secretary
Jean Sese	Director, Department of Foreign Affairs
Leymang Gerard	Adviser
Yvon Basil	Bilateral Aid Officer, Asia/Pacific Division

National Planning Office

George Maniuri	Director
Andrew Mcintyre	Infrastracture Planning Adviser
Johnson Wabaiat	Principal Aid Administrator
Jimmy Andeng	Principal Planning Officer
Flora Kalsaria	Aid Administrator
Ian Abbil	Assistant Engineer

Ministry of Home Affairs

David Karie Robert	Minister
Leonard Bule	First Secretary
Simon Poilapa	Second Secretary
Allan Dan	Third Secretary
Tinsley Lulu	Director, Department of Provincial Affairs
Harry Tete	Principal Physical Planning Officer, Department of Provincial Affairs

Public Woprks Department (Ministry of Transport, Public Works, Civil Aviation, Ports and Marine, and Urban Water Supply)

(Port Vila)

Jim Ngwer	Acting Director, EFATE Subdivision, Public Works Department
Ray Roberts	Principal Projects Engineer, Public Works Department
Jone Rogara	Assistant Project Manager, Public Works Department
Phil Evans	Fleet Manager, Public Works Department

(Luganville)

Philip Amos	Regional Engineer, Public Works Department
Huliano Jean	Foreman Mechanic, Public Works Department

National Housing Corporation

Paul Willie	General Manager
Peter Faran	Adviser

Port Vila Municipality

Alick Georges Noël	Mayor
Calo Georges	Town Clerk
Fatani Sove	Dupty Town Clerk
Tony Ata	Environmental Health Officer

Luganville Municipality

Maryline Amhambath	Mayor
Paul Hakwa	Town Clerk
Andrew B. Ala	Environmental Health Officer

South Pacific Regional Office, ADB

M.E.Tusneem	Regional Representative
Christopher J. Wensley	Project Engineer

4. Minutes of Discussions

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY
ON
THE PROJECT FOR IMPROVEMENT OF WASTE DISPOSAL
IN
THE REPUBLIC OF VANUATU

In response to the request of the Government of the Republic of Vanuatu, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Waste Disposal (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Vanuatu the basic design study team (hereinafter referred to as "the Team"), headed by Mr. Kanji Kitazawa, Director, First Project Management Division, Grant Aid Project Management Department, JICA, from January 20 to February 10, 1996.

The Team held discussions with the officials concerned of the Government of the Republic of Vanuatu and conducted a field survey at the study area.

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

Port Vila, February 7, 1996

Mr. Kanji Kitazawa
Leader,
Basic Design Study Team,
JICA

Mr. George Maniuri
Director,
National Planning Office

ATTACHMENT

1. The objective of the Project

The objective of the Project is to improve the situation of sanitation in Port Vila and Luganville through the supply of equipment necessary for waste disposal.

Target year will be 2001 which represents an adequate planning horizon for the proposed Vanuatu solid waste management plan.

2. The Project Sites

The Project areas are located in Port Vila city and Luganville city. (See Annex I)

3. Executing Agencies

The National Planning Office is responsible for the administration and the Department of Provincial Affairs the execution of the Project.

4. Items requested by the Government of the Republic of Vanuatu

After discussions with the Team, the equipment described in Annex II were finally requested by the Government of the Republic of Vanuatu.

However, the final components of the Project will be decided after further studies in Japan.

5. Japan's Grant Aid System

1) The Government of the Republic of Vanuatu has understood the system of Japan's Grant Aid Program explained by the Team. (See Annex III.)

2) The Government of the Republic of Vanuatu will take the necessary measures described in Annex IV for the smooth implementation of the Project, on condition that Japan's Grant Aid is extended to the Project.

6. Basic Design Study

JICA will make a basic design study report on the Project in English and send it to the

Government of the Republic of Vanuatu by the end of April, 1996.

7. Other Relevant Issues

1) Both sides agreed to cover only domestic solid waste under the Project excluding medical, industrial and other hazardous wastes.

2) The Government of the Republic of Vanuatu requested the Team to install garages for storing the equipment to be supplied under Japan's Grant Aid, in Luganville and at the Bouffa landfill site in Port Vila.

The Team stated that it will transmit the request to the Government of Japan and mentioned that the request will be acceptable to the Government of Japan under condition that the Government of the Republic of Vanuatu shall take necessary measures to undertake the following:

- Land acquisition
- Land clearance
- Foundation works
- Installation of garages, using the material to be supplied under Japan's Grant Aid

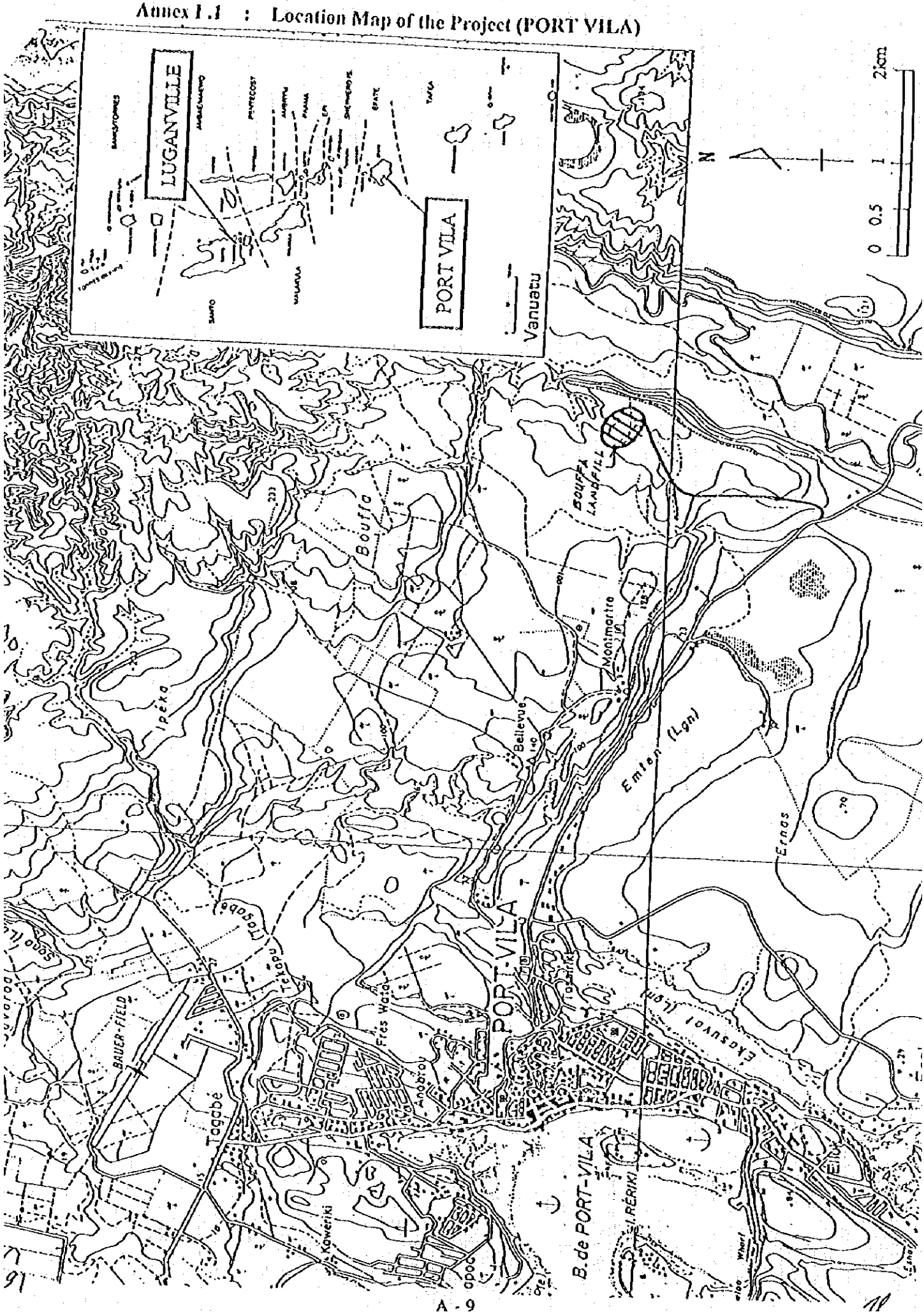
(NOTE)

It is agreed that land acquisition, land clearance and foundation works shall be accomplished by the end of December, 1996, because the requested equipment is expected to be supplied at the beginning of the year 1997.

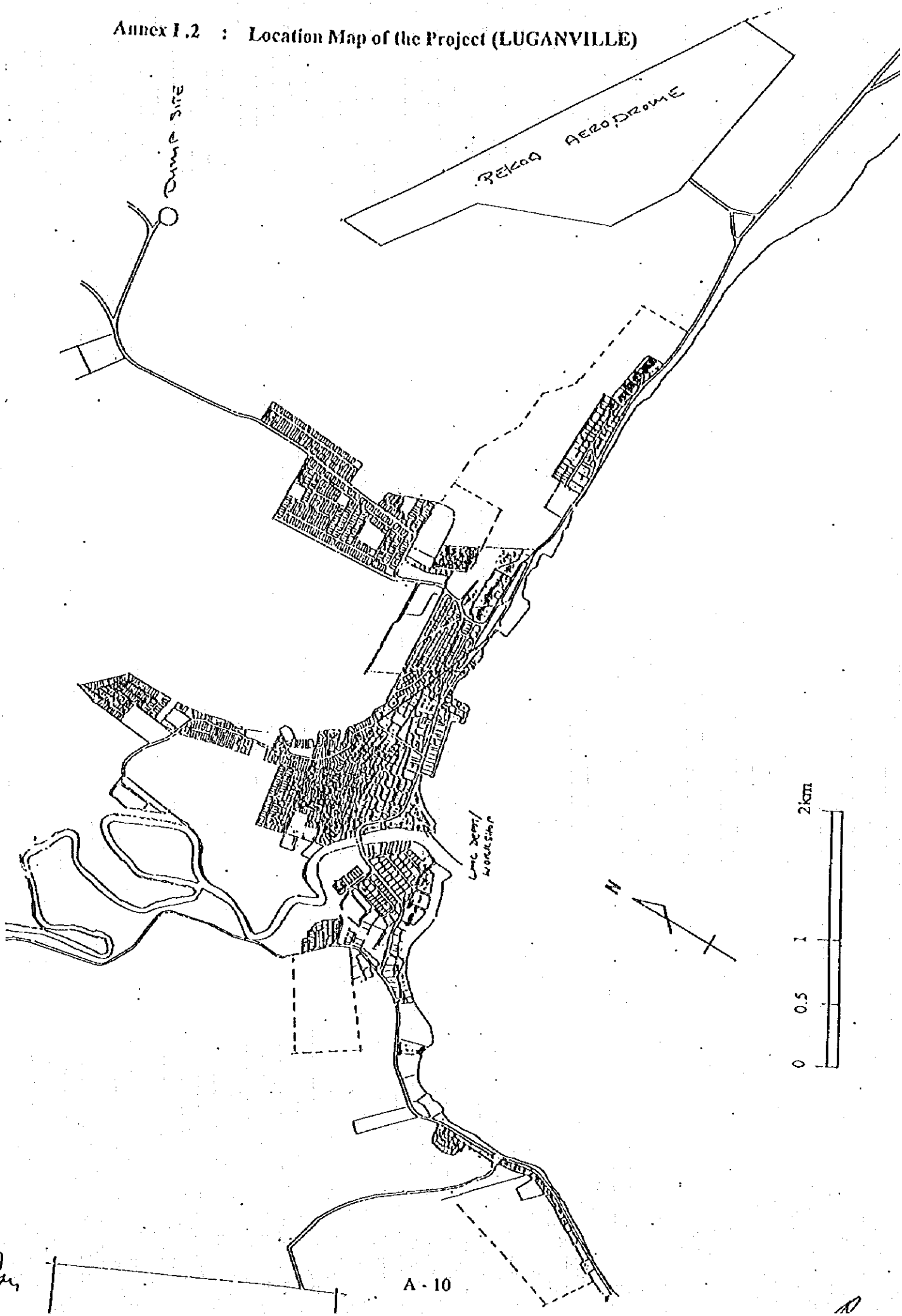
3) Maintenance of the equipment to be supplied under Japan's Grant Aid should primarily be carried out under the responsibility of both the municipalities of Port Vila and Luganville. However, in view of the low capability of maintenance at the level of the municipalities, both sides agreed that the Government of the Republic of Vanuatu shall take necessary arrangements so that the Public Works Department will assist on a cost recovery basis in order to ensure good operation and maintenance of the equipment in the event of technically difficult problems.

4) For the purpose of the successful implementation of the Project, it is agreed that the Government of the Republic of Vanuatu will ensure that the municipalities concerned will allocate the necessary number of staff including operators and budget for the proper operation and maintenance of the equipment to be supplied under Japan's Grant Aid.

Annex I.1 : Location Map of the Project (PORT VILA)



Annex I .2 : Location Map of the Project (LUGANVILLE)



Annex II : Equipment List

1. PORT VILA

Item No.	Type of Equipment	Quantity
1	Collection vehicle (Dump truck with container(11m^3))	2
2	Open top skip (8m^3)	6
3	Open top skip (4m^3)	10
4	Flat bed tipper truck equipped with skid & loading arm to handle and empty skip	1
5	4 ton capacity tipper truck with grab type crane attached (3 ton)	1
6	Backhoe loader (4WD)	1

Note: As for Item No.5, the Government of the Republic of Vanuatu requested the Team to consider loading capacity of at least 10 m^3. The Team stated that the capacity will be decided after further study in Japan so as to meet the request.

2. LUGANVILLE

Item No.	Type of Equipment	Quantity
1	Collection vehicle (Dump truck with container(7m^3))	1
2	4 ton capacity tipper truck with grab type crane attached (3 ton)	1

Note: As for Item No.2, the Government of the Republic of Vanuatu requested the Team to consider loading capacity of at least 10 m^3. The Team stated that the capacity will be decided after further study in Japan so as to meet the request.

Annex III : Japan's Grant Aid Scheme

1. Grant Aid Procedures

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

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

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

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

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

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

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

2. Basic Design Study

(1) Contents of the Study

The aim of the Basic Design Study (hereafter referred to as "the Study"), conducted by

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

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

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

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

d) Preparation of a basic design of the Project

e) Estimation of costs of the Project

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

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

(2) Selection of Consultants

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

repeated.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

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

(2) Exchange of Notes (E/N)

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

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

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

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

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

(5) Necessity of "Verification"

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

(6) Undertakings required of the Government of the Recipient Country

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

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.

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

c) To secure buildings prior to the procurement in case the installation of the 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 work.

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

h) "Re-export"

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

i) Banking Arrangement (B/A)

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

2) 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 IV : Necessary measures to be taken for the Project by the Government of the Republic of Vanuatu in case Japan's Grant Aid is extended

1. To bear advising commissions of Authorization to Pay (A/P) and payment commission to an authorized foreign exchange bank in Japan for the banking services based upon the Banking Arrangement (B/A).

2. To ensure prompt unloading, tax exemption, customs clearance at port of disembarkation in Vanuatu and prompt internal transportation of the equipment to be supplied under Japan's Grand Aid.

3. To accord Japanese Nationals whose services may be required in connection with the supply of the equipment and services under the verified contracts such as may be necessary for their entry into Vanuatu and stay therein for execution of the Project.

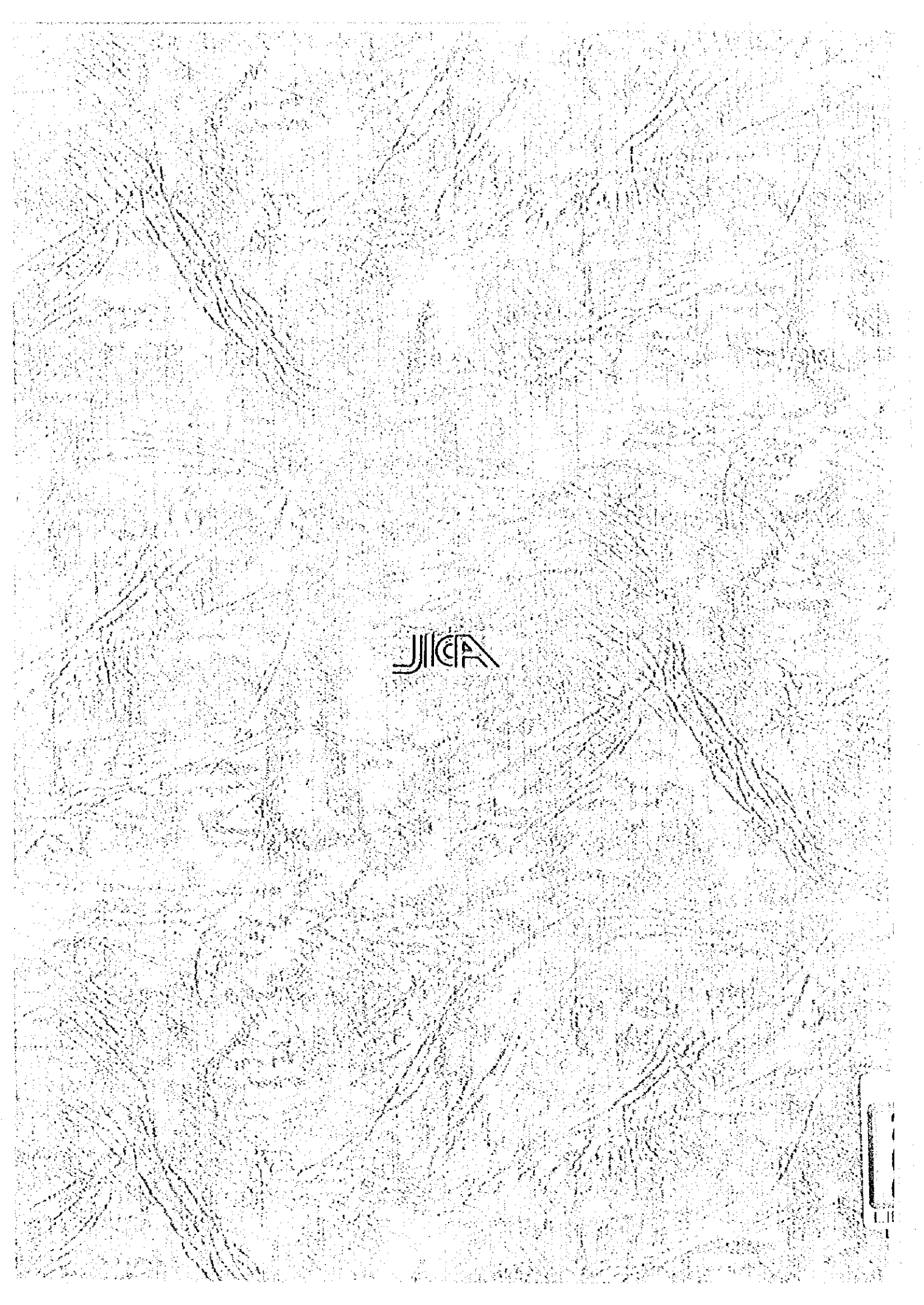
4. To exempt Japanese nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Vanuatu with respect to the supply of the equipment and services under the verified contract.

5. To provide necessary permissions, licenses and other authorizations for carrying out the Project.

6. To maintain and use properly and effectively the equipment supplied under Japan's Grant Aid.

7. To bear all expenses other than those to be borne by Japan's Grant Aid, necessary for the supply of equipment.

8. To take necessary actions to expedite the procedures necessary for smooth execution of the Project by the authorities concerned in Vanuatu.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