

No. 1

Study Report
on
The Project
for
Improvement of Solid Waste Management
in
The City of Colombo
in
The Democratic Socialist Republic of Sri Lanka

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PREFACE

In response to a request from the Government of the Democratic Socialist Republic of Sri Lanka, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Solid Waste Management in the City of Colombo and entrusted the Japan International Cooperation Agency (JICA) to conduct the study with the assistance of the Japan International Cooperation System (JICS).

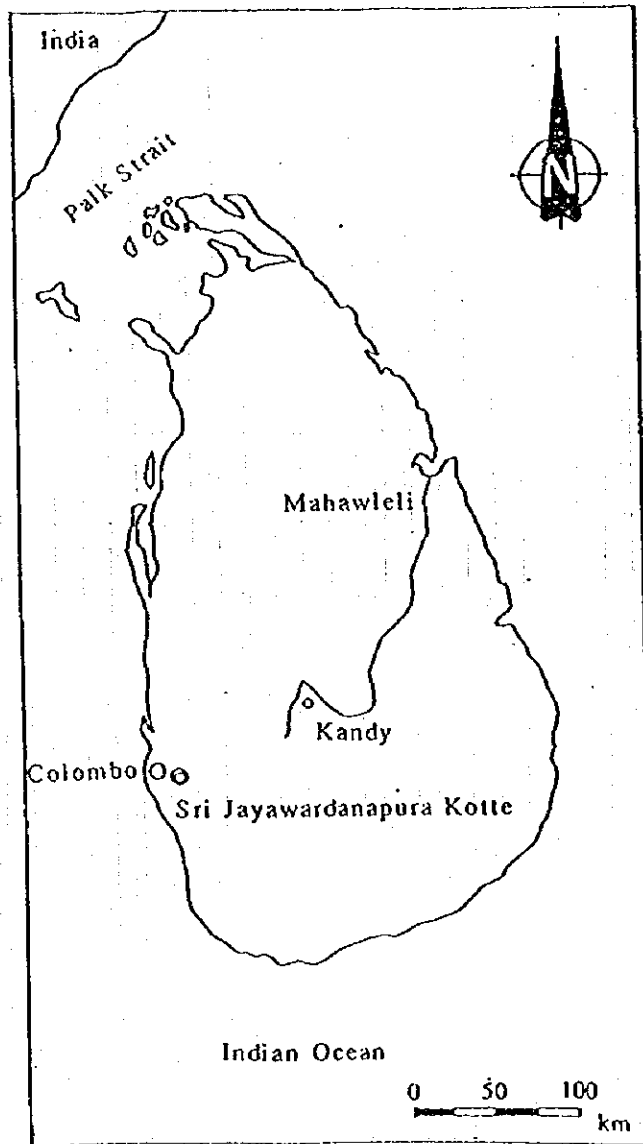
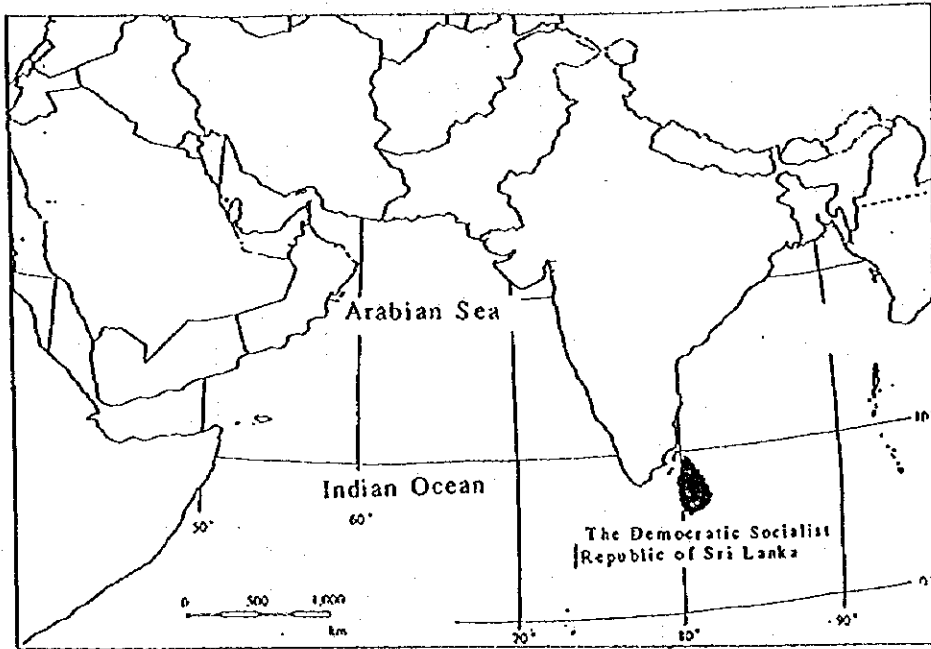
I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

I wish to express my sincere appreciation to the officials concerned of the Government of the Democratic Socialist Republic of Sri Lanka for their close cooperation extended to the team.

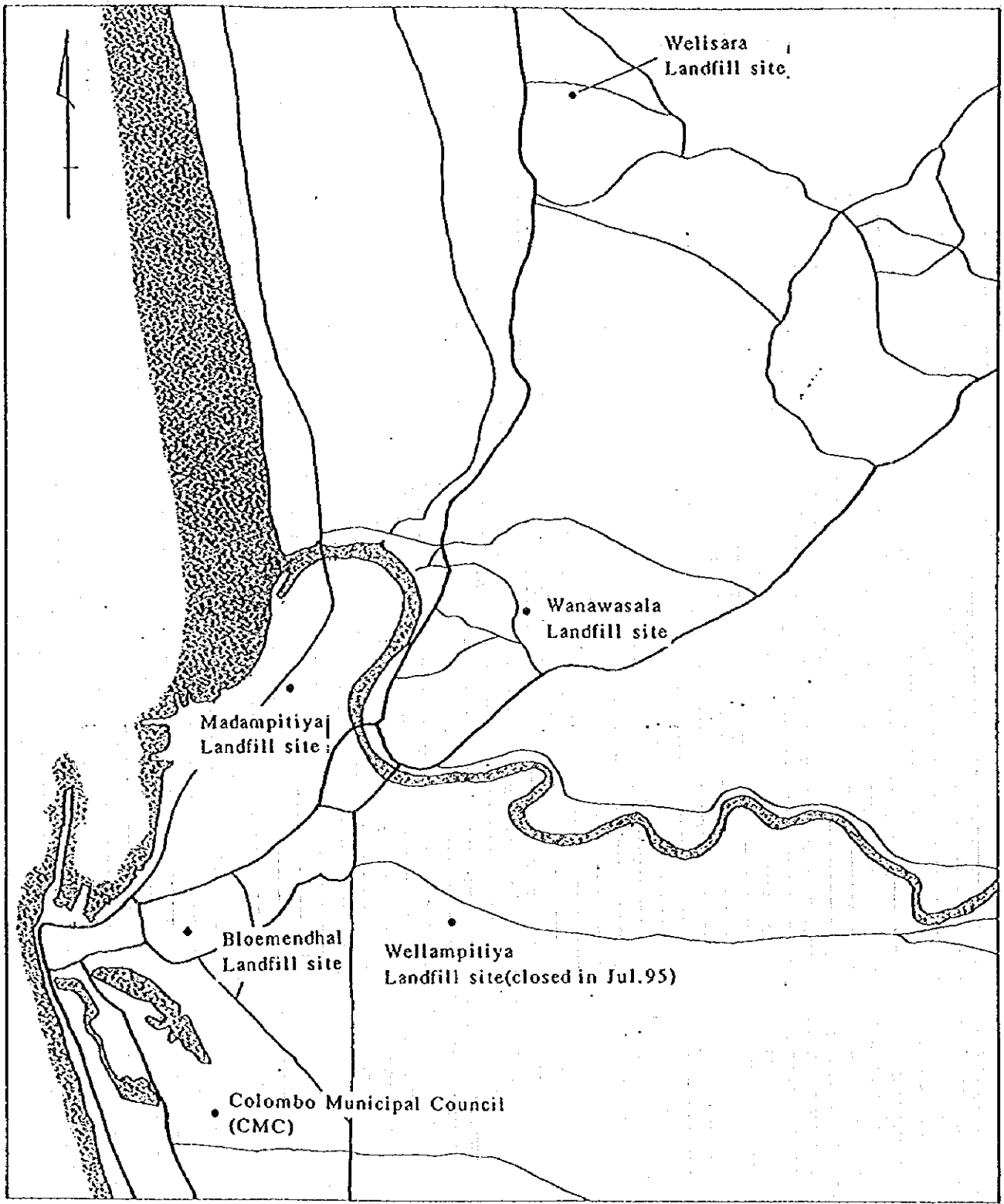
March 1996

Kimio Fujita
President

Japan International Cooperation Agency



Location of the Democratic Socialist Republic of Sri Lanka.



Location of Landfill site in the city of Colombo

Abbreviations

CMC-Colombo Municipal Council

Compactor Truck-Garbage Truck

4WD-Four Wheels Drive

2WD-Two Wheels Drive

CONTENTS

Location Map/Perspective	
Abbreviations	
Chapter 1 Background of the Project	1
Chapter 2 Contents of the Project	2
2.1 Objective of the Project	2
2.2 Basic Concept of the Project	3
2.2.1 Examination of Requested Items by Preliminary Study Team	3
2.2.2 Examination of Equipment	5
2.3 Basic Design	13
2.3.1 Design Concept	13
2.3.2 Basic Design	15
Chapter 3 Implementation Plan	18
3.1 Implementation Plan	18
3.1.1 Implementation Schedule	18
3.1.2 Obligations of recipient country	19
3.2 Maintenance Plan	19
Chapter 4 Project Evaluation and Recommendations	21
4.1 Project Effects	21
4.2 Recommendations	22
Attached documents	
Document 1 Collection volume in 1994	
Document 2 Operation rate on June 1995	

Chapter 1 Background of the Project

The city of Colombo, the subject city of the Project, has a population of approximately one million, consisting of some 650,000 permanent residents and 350,000 temporary residents, producing waste of more than 600 tons/day. The work to collect, transport and dispose of the waste is conducted by the Solid Waste Management of the Colombo Municipal Council (CMC) with a fleet of 116 vehicles, and the CMC collected some 400 tons/day of waste in 1994 (refer to document 1). The great deterioration of the fleet means that the operating rate dropped to as low as 55% in July, 1995 (refer to document 2). As a result, the uncollected waste in many places in the city is causing not only bad odour but also the propagation of harmful insects to the detriment of the general hygiene of the city.

In July, 1995, the Wellampitiya landfill site became completely full and CMC has since been forced to use the present temporary site. Although the Welisala disposal site which is currently under construction with the assistance of the World Bank will become available in 1998, the long distance to this site from the city center will reduce the number of daily trips of the garbage trucks to less than half of the present level, causing grave concern in regard to a sharp decline of the waste collection rate.

In short, deterioration of the fleet and the long distance to the new disposal site have pushed the issue of waste collection to the top of the CMC's important agenda.

In order to deal with the worsening situation, the CMC procured 12 trucks in December, 1995 and is constructing a workshop with its own budget to exclusively maintain and repair waste collection vehicles and equipment in order to improve the operation rate of the waste collection fleet. These measures, however, are inadequate to cope with the growing waste volume which is increasing at a rate of 2%/year to 648 tons/day in 1998.

With the present fleet, the collection in 1998 is expected to drop to approximately 177 tons/day.

CMC already allocates as much of its budget as possible to the waste collection service but is now finding it extremely difficult to procure additional waste collection vehicles or equipment. The budget for the procurement of new tools and equipment for the new workshop is also quite limited. Under these circumstances, the CMC has made a request to the Government of Japan for the provision of grant aid to improve the waste collection service in Colombo.

Chapter 2 Contents of the Project

2.1 Objectives of the Project

CMC has adopted the target of collecting almost all of the 648 tons/day of waste which is expected to be generated in 1998 to improve the state of hygiene in the city. The objectives of the Project are to improve the waste collection and transportation capability of the city's waste collection service through the procurement of new vehicles and equipment and to stabilize the operation rate of the waste collection trucks through improvement of the workshop tools and equipment to achieve the above target.

2.2 Basic Concept of the Project

2.2.1 Examination of Requested Items by Preliminary Study Team

The original request made by CMC was quite extensive and covered many fields, including waste collection and transportation vehicles and equipment, equipment for a transfer station as well as final disposal site, construction of a final disposal site and maintenance tools and equipment, etc. Of these items, equipment for a transfer station has been dropped from the scope of the present Project due to technical problems involved in the accumulation of waste and its transfer to larger trucks and the problem of the transfer vehicle maintenance cost, etc.

In addition, the construction of a final disposal site and the provision of associated equipment have been dropped from the scope of the Project as it has become impossible to secure land extension at the Mahara sanitary landfill site.

The commencement of operation at the Welisala disposal site suggests the need for the introduction of a new transfer station. However, the construction of a new transfer station must be determined based on a master plan for the entire metropolitan area and not for the convenience of the CMC (such a master plan is currently being prepared). Coupled with the fact that land for a transfer station has not yet been secured, the provision of equipment for a transfer station has been dropped from the scope of the Project.

As explained above, the scope of the Project is confined to the procurement of waste collection and transportation vehicles and relevant workshop equipment. The priority of the items of the final request, decided through consultations with the CMC, is given in Table 1.

Table-1 PRIORITY OF REQUIRED EQUIPMENTS

Vehicle/Equipment	Priority			Qty
	A	B	C	
Compactor Trucks 11-13m3	55	5	0	60
Compactor Trucks 6-8m3	20	5	0	25
Multi-Loaders (Skip Hoist Trucks)	4	2	0	6
Containers for Multi-Loaders (without lid)	20	11	9	40
Containers for Multi-Loaders (with lid)	8	0	0	8
Dump Trucks 11m3	6	0	0	6
Dump Truck 5m3	2	0	0	2
Wheel Loader 0.8m3	2	1	1	4
Pick-Up Trucks 2WD, single cabin	3	2	2	7
Pick-Up Trucks 4WD, double cabin	2	0	0	2
Workshop Equipment	1set	0	0	1

2.2.2 Examination of Equipment

The volume of waste which is expected to be generated and collected in 1998 following an increase of Colombo's population is as follows and comprises the basis for determination of the required number of trucks.

(1) Estimation of Generated Volume of Waste

CMC has investigated the volume of waste generated by income level in 1995. Based on the investigation, is shown Table-2, estimated generation of waste in Colombo in 1998 inclusive of the expected population increase approx. 1%/year -based on the figure provided by the Statistical Bureau

The estimated generation of waste total is 648 tons/day.

Table-2 Estimated generation of waste in Colombo in 1998

Income level	Population	Generation rate(kg/person/day)	Generation (ton /day)
Low income	386,500	0.5	193
Middle income	281,000	0.75	211
High income	35,000	1.1	39
Others (tourist, etc)	410,000	0.5	205
Total	1,112,500	Average 0.576	648 (ton/day)

(2) Estimation of waste collection volume in 1998

Estimation of waste collected by existing vehicles is calculate with the following formula:

$$\text{Collection volume} = \text{Number of vehicles of each type} \\ \times \text{loading capacity} \times \text{number of trips} \times \text{operation rate}$$

CMC classified the usage year of current equipments into three categories, determined the operation rate corresponding to each category, and sought the collection ability according to the above mentioned formula. Table 3 shows the results of these calculation. At CMC, the operation rates corresponding to each category are: 80% for those with usage year of less than 3 years, 60% for those with more than 3 years and less than 5 years, 20% for those with more than 5 years and less than 8 years, and those with more than 8 years of usage years in either disposed or considered as having an operation rate of 0%. From the preliminary study, it was determined that the above mentioned change in operation rate, load weight, and number of trips and calculated based on CMC's performance. It should be noted that though the average current number of trips is approximately 2 to 4 times. This was done because the distance between the city center and the new processing plant at Welisala is a approximately 1.5 times the distance between current processing plant.

The above estimation results suggest that 648 tons of waste/day will be generated in 1998, of which 470 tons will not be collected. This figure of 470 tons/day is the basis for determining the scope of the collection and transportation vehicles, etc. to be provided under the Project to allow for the entire collection of waste generated in 1998.

Table-3 Collect able Volume by Available Vehicles in 1998

*

Vehicle		Number of Available	Loading Capacity	Number of trip/day	Operation Rate	Estimation	Collection Volume (tons/day)
Type	Age	Vehicles					
Compactor Trucks 11m ³ ~13m ³	Up to 3 years	12	4	2	0.8	12×4×2×0.8	76.8
	3 - 5 years	5	4	2	0.6	5×4×2×0.6	24.0
	More than 5 years	20	4	2	0.2	20×4×2×0.2	32.0
Compactor Trucks 6m ³ ~8m ³	Up to 3 years	0	3	2	0.8	0×3×2×0.8	0
Tractor (FOR AGRICULTURE)	Up to 3 years	12	1.5	2	0.8	12×1.5×2×0.8	28.8
	3 - 5 years	3	1.5	2	0.6	3×1.5×2×0.6	5.4
Multi-Loaders	Up to 3 years	0	3	2	0.8	0×3×2×0.8	0
	3 - 5 years	3	3	2	0.6	3×3×2×0.6	10.8
Total Collection Volume							177.8
Collection Rate Vis-a-Vis Daily Waste Generated (648tons)							27.4%

* Except Dump Truck's data

* Vehicle with usage year of more than 8 years are not included because of the operation rate of 0%.

(3) Examination of Required Number of Vehicles and Equipment

a. Large Compactor Trucks

The collection volume in 1998 is expected to increase to 484 tons/day. As the available equipment is only capable of collecting 132.8 tons/day, new compactor trucks will be required to collect the remaining 352 tons/day to achieve the entire collection of this volume.

Using the equation used for estimation of the collection volume and assuming the introduction of new compactor trucks, required number of large compactor trucks are calculated with the following formula which is modified:

The number of Large Compactor Truck = collection volume ÷ waste weight ÷ trips ÷ day ÷ operation rate

The number of required large compactor truck is
 $352 \text{ tons} \div 4 \div 2 \div 0.8 = \underline{55 \text{ units}}$

b. Small Compactor Trucks

The collection volume in 1998 is expected to increase to 132 tons/day. The use of small compactor trucks with a high collection efficiency is planned under the Project to replace tractors for waste collection. These new small compactor trucks will be capable of collecting 97.8 tons of waste/day. The remaining 34.2 tons should not pose any problem as this volume can be easily dealt by tractors.

The number of required small Compactor Truck:

$97.8 \div 3 \div 2 \div 0.8 = \underline{20 \text{ units}}$

c. Multi-Loaders

The collection volume in 1998 is expected to increase to some 30 tons/day and the available multi-loaders have a collection capacity of some 10.8 tons/day. The remaining 19.2 tons should be collected with new multi loaders.

The number of required multi-loaders is $19.2 \div 3 \div 2 \div 0.8 = \underline{4 \text{ units}}$

d.Container for Multi-Loader

To prevent the spilling of meat and fish scraps when transporting waste from markets 8 covered containers will be procured with 20 containers for the 6 CMS's waste collection districts.

e.Container for small Compactor Truck

20 containers will be provided for each small compactor truck as samples so that the CMC can manufacture the remaining number of required containers using its own budget. During the manufacturing period, the 20 sample containers will be used to load waste to small compactor trucks in addition to manual loading work.

f.Dump Trucks

While all 9 of the trucks appear ready to be scrapped in the near future due to the extremely demanding operation conditions, they have been extensively repaired and are still in use. The required number of new dump trucks is 8, consisting of six 7.5 ton class trucks for the collection and transportation of waste construction timber, etc. to be used on ordinary roads and two 3.5 ton class trucks to be used in narrow streets.

f.Wheel Loaders

Wheel loaders are used to remove waste timber, etc. scattered in the streets. In view of the general road width in Colombo, the bucket width is set at approximately 1,900 - 2,100 mm. of the existing 5 wheel loaders, 4 procured in 1994 are the same as the planned new wheel loaders. As the operation rate is expected to have declined by 1998, 2 additional wheel loaders will be required as supplements.

g. Pick-Up Trucks

Three 2 WD single cabin pick-up trucks will be required for the districts of 1, 2B and 4 because of the lack of vehicles to supervise waste collection work and also to transport spare parts and tools, etc. In addition, two 4 WD double cabin trucks will be required for the general management of the waste collection service in view of the muddy roads around the landfill site.

h. Workshop Equipment

Under the Project, 142 new vehicles, etc. will be procured and provided to the CMC. The provision of maintenance equipment for the new workshop under construction by Dec. 1996 (for the exclusive maintenance of waste collection and transportation vehicles) should ensure the swift and appropriate maintenance of the entire fleet. The provision of such equipment will also be required to stabilize the operation rate of the fleet. In short, maintenance equipment is necessary for an effective implementation of the Project and one set of workshop equipment which meet the requirements of the new vehicles will be procured.

With the procurement of all the planned new vehicles, the estimated total collection volume and collection rate in 1998 are 645 tons/day and 99.5% respectively as shown in Table 6.

Table 4 Estimated Collection Volume by Type of Vehicle in 1998

Vehicle		Number of Available		Loading Capacity	Number of trip/day	Operation Rate	Estimation	Collection Volume (tons/day)
Type	Age	Existing	New					
Compactor Trucks 11m ³ ~13m ³	Up to 3 years	12	55	4	2	0.8	(12+55)×4×2×0.8	428.8
	3 - 5 years	5	8	4	2	0.6	5×4×2×0.6	24.0
	More than 5 years	20	0	4	2	0.2	20×4×2×0.2	32.0
Compactor Trucks 6m ³ ~8m ³	Up to 3 years	0	20	3	2	0.8	20×3×2×0.8	96.0
Tractor (FOR AGRICULTURE)	Up to 3 years	12	0	1.5	2	0.8	12×1.5×2×0.8	28.8
	3 - 5 years	3	0	1.5	2	0.6	3×1.5×2×0.6	5.4
Multi-Loaders	Up to 3 years	0	4	3	2	0.8	4×3×2×0.8	19.2
	3 - 5 years	3	0	3	2	0.6	3×3×2×0.6	10.8
Total Collection Volume								645
Collection Rate Vis-a-Vis Daily Waste Generated (648tons)								99.5%

* Except Dump Truck's data

* Vehicles with usage year more than 8 years are not included because of the operation rate of 0%.

(4) Examination of Vehicle Specifications

a. Large Compactor Trucks

The cubic capacity of the large compactor trucks will be the same as existing large compactor trucks of 11 m³ - 13 m³ and each truck will have a hydraulic mechanism to lift the containers currently used by the CMC. (These containers will be used without modification).

Exhaust brake and heavy duty leaf spring will be equipped in order to prevent overload for brake system/under chassis during operation.

b.Small Compactor Trucks

Each small compactor truck should have a hydraulic mechanism to lift a 0.6 m³ container.

c.Multi-Loaders

As in the case of the existing multi-loaders, the new multi-loaders should be capable of lifting and transporting the containers currently used by the CMC.Exhaust brake and heavy duty leaf spring will be equipped in order to prevent overload for brake system/under chassis during operation.

d.Multi-Loader Containers

All the containers should be able to be used by the multi-loaders currently owned by the CMC.Rust proof body is necessary.

e.Dump Trucks

As in the case of the existing dump trucks, the rear gate of the dump trucks will be either a double-leafed hinged door or a single hinged door for the efficient dumping of waste.

f.Wheel Loaders

In view of the general road width in Colombo, the bucket width will be approximately 1,900 - 2,100 mm.Loading height should correspond to the height of dump body.

g.Pick-Up Trucks

Diesel engine is required.

2.3 Basic Design

2.3.1 Design Concepts

(1) Principle Regarding Natural Conditions

- Given mean monthly rainfall of as high as 300 mm in the rainy season, all the vehicles should have high corrosion resistance and electrical insulation levels.

(2) Principle Regarding Use of Local Agents

- The planned vehicles should be able to receive after-services, including technical guidance, from local agents.

(3) Principles Regarding Maintenance Capability of Project Implementation Body

- The tools should not require any construction or installation work for their use.
- One expert should be dispatched to Sri Lanka to explain the usage, etc. of the tools (diesel timing tacho-tester, 4 poles lift, lathe for brake drums, tire changer, battery charger with engine start function, headlight tester, pressurized water cleaner and air transformer, etc.)

(4) Principles Regarding Vehicle Procurement, etc.

- The vehicle specifications should be the same as or equivalent to those of the existing vehicles in use by the CMC (in the case of large compactor trucks with a loading capacity of 11 m³ - 13 m³).
- The specifications of the new containers should be the same as those of the existing containers in use by the CMC (in the case of multi-loader containers).

- Each small compactor truck (with a loading capacity of 6 m³ - 8 m³) should be equipped with a hydraulic mechanism or any to lift a 0.6 m³ container.
- The hydraulic unit attached to compactor trucks should have a safety device, such as an emergency stop button.
- In regard to spare parts, these will be carefully selected, particularly to ensure a supply of hydraulic pumps, cylinder parts, sealing parts and cables, etc. for the compactor trucks.

(5) Principles Regarding Procurement

- This Project should be completed with in a single fiscal year. Attentions have to be paid to timely execution of procurement, particularly for the complex vehicles or containers which require four to five months for outfitting. Unloading and customs clearance at the port of Colombo have to be well prepared so as not to invite any interferences.

2.3.2 Basic Design

(1) Distribution of Planned Vehicles and Equipment

The distribution plan for the new vehicles and equipment to be provided under the Project is shown in Table 5. More new vehicles will be allocated to the waste collection district of 2A because waste to be generated in the district in 1998 is expected to increase, which will result in harsh usage of vehicles.

The district of 1, 2B and 4, which generate less waste than 2A and are located far from the city center, will be allocated a 2WD pick-up truck respectively for the general management of the waste collection service.

Table 5 Distribution Plan for Planned Vehicles/Equipment

District	Compactor Truck		Multi-Loader	Dump Truck		Wheel Loader	Pick Up	
	11-13m	6-8m		11m	5m		2WD	4WD
1	6	3	1	1	-	1	1	-
2A	16	5	-	1	-	-	-	-
2B	10	4	2	1	1	-	1	-
3	9	3	-	1	1	-	-	-
4	5	2	1	1	-	1	1	-
5	9	3	-	-	-	-	-	-
Administration	-	-	-	-	-	-	-	2
	55	20	4	5	2	2	3	2

The distribution plan for the containers to be provided under the Project is shown in Table 6. The 0.6 m³ containers will be allocated to each district together with small compactor trucks. Two containers with lid will be allocated to the districts of 1 and 2A with large markets respectively, and one container to the other districts.

Five containers without lid will be allocated to the 2A district and two to the districts of 4 and 5, which are relatively far from the city center, respectively.

Table 6 District Data and Planned Distribution of Container

District	Collection Points	Container (0.6m ³)	Container (with lid)	Container (without lid)
1	253	3	2	4
2A	243	5	2	5
2B	186	4	1	4
3	158	3	1	3
4	91	2	1	2
5	77	3	1	2
Total	1,008	20	8	20

(2) Details of Planned Vehicles and Equipment

The main specifications, quantity and purpose of use of each vehicle/equipment are shown in Table 7.

Table 7 Details of Planned Vehicles and Equipment

Vehicle /Equipment	Specifications	Qty	Purpose of Use
1. Compactor Trucks	11-13m ³	55	For the ordinary collection and transportation of waste; the figure includes replacement of existing trucks
2. Compactor Trucks	6-8m ³	20	For the collection and transportation of domestic waste in narrow streets
3. Container	0.6m ³	20	For improved collection efficiency through combined use with 6 - 8 m ³ capacity compactor trucks
4. Multi-Loaders	5m ³	4	For use in markets and at other sites where a large volume of waste is generated
5. Container for Multi-Loaders	5m ³ (without lid)	20	For the transportation of waste which is unlikely to be blown off or produce bad odour
6. Container for Multi-Loaders	5m ³ (with lid)	8	For the transportation of waste which produces bad odour due to decomposition and animal dung, etc.
7. Dump Trucks	11m ³	6	For the collection of a large volume of street rubbish and waste construction timber, etc.
8. Dump Trucks	5m ³	2	For the collection of a minor volume of street rubbish, rubbish in narrow streets or abandoned rubbish
9. Wheel Loader	0.8m ³ (Bucket)	2	For the collection of market waste or street rubbish
10. Pick-Up Truck	2WD, single cabin	3	For the conveyance of waste collection work-related instructions or equipment transportation
11. Pick-Up Truck	4WD, double cabin	2	For the conveyance of waste collection work-related instructions or transportation or equipment on bad roads, etc.
12. Workshop Equipment	-	1	For the maintenance of waste collection and transportation vehicles

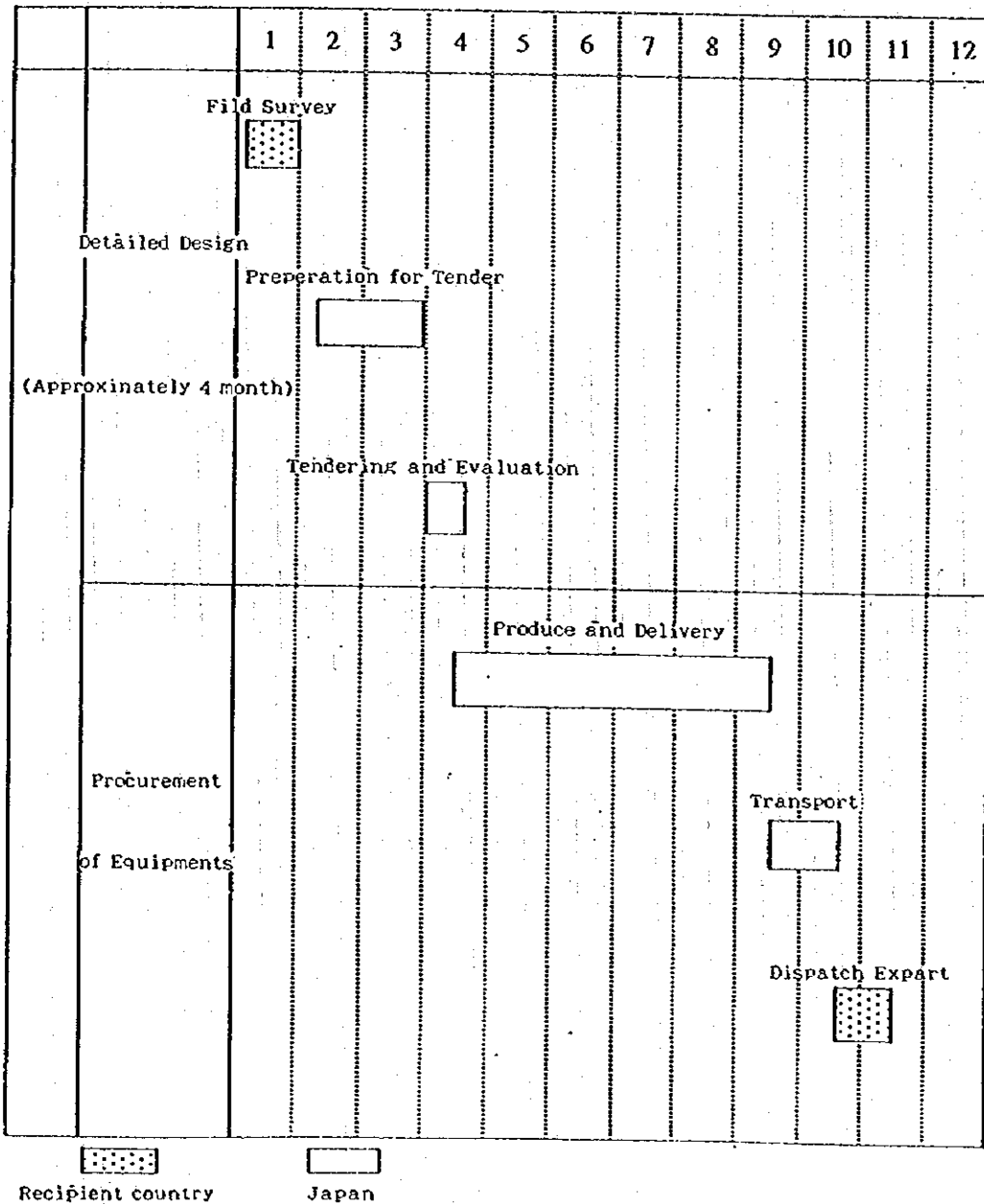
Chapter 3 Implementation and Maintenance Plans

3.1 Implementation Plan

3.1.1 Implementation Schedule

The Project will be implemented in a period of 11 months as detailed in Table 10.

Table 10 Project Implementation Schedule



3.1.2 Obligations of Recipient Country

- a) Prompt execution of unloading at the port and customs clearance.
- b) Exemption of custom duties and domestic taxes on the equipment procured and on the activities performed for the procurement.
- c) Providing necessary conveniences for disembarkation and stay of Japanese nationals who engage this procurement.
- d) Bearing of all the necessary fees which are not covered by the Grant Aid.
- e) Assignment of a counterpart.
- f) Proper maintenance and operation of procured equipment.
- g) Conclusion of bank agreement.
- h) Construction of a workshop to maintain waste collection vehicles/equipment within the planned period.
- i) Improvement of the landfill waste disposal method at the temporary landfill site.

3.2 Maintenance Plan

With the implementation of the Project, the recruitment of 28 new collection workers (including drivers) and 5 mechanics for the workshop is planned, necessitating the CMC's provision of new funding to cover the increased maintenance cost. Using the hire cost calculation table for construction machinery, etc. and taking Colombo's specific conditions into consideration, the required annual funding to cover the additional maintenance cost is (Japanese Yen)23,281,200. This figure represents approximately 0.4% of the CMC's annual budget of some 5.7 billion yen and 4.6% of the CMC's annual Solid Waste Management budget of 504,579,000 (Yen). CMC's provision of funding since 1994 to 1995 has been increased 33.4% and is believed to be manageable within the present funding capability of the CMC. Table 9 shows Operation and Maintenance Costs for New Compactors.

Table 9 Operation and Maintenance Costs for New Compactors

(Unit:1,000yen)

Cost Item	Amount
Management	2,092.8
Maintenance/Repair	7,377.4
Personnel	3,960.0
Spare Parts	5,880.0
Fuel	3,635.0
Oil and Lubricants	336.0
Total	23,281.2

Chapter 4 Project Evaluation and Recommendations

4.1 Project Effects

If the Project is not implemented, the collection rate in 1998 is expected to decline to approximately 177.8 tons/day 27% of the increased waste of 648 tons/day due to a decline of the operation rate of collection vehicles caused by aging and deterioration of the vehicles. In contrast, implementation of the Project will improve the collection rate to 99.5%, providing the prospect of clearing waste from the streets of Colombo, preventing the propagation of such harmful insects as mosquitoes, flies, pollution from scattered waste, outflow of waste water and bad odour, and others, as well as rates of transmit to infectious diseases.

As described above, the Project is expected to substantially contribute to the conservation/improvement of the urban environment in Colombo. The benefits of the Project and improvement in BHN will be enjoyed by the entire population and commuters to Colombo, the total number of which is expected some 1,100,000 including low income grope. There is an urgent need for the Project to be implemented in view of the deterioration of existing old vehicles. Equipments to be procured similar to the current model to offset maintenance/operation cost.

Given the number of beneficiaries and positive effects of the Project, the project contents are deemed highly appropriate.

4.2 Recommendations

If the following points improved/implemented, the project is expected to be completed on effectively and smoothly.

a) In operating the temporary landfill site until such time when the Welisala landfill site becomes available, the CMC should operate the temporary site in an environment-friendly manner, including the implementation of work to prevent the seepage of foul water from the site using a clay layer, etc., general improvement of the dumping platforms, zoned land filling and soil cover application every 2 days.

b) CMC should introduce the separate discharge and disposal of infectious waste from other types of waste.

c) CMC should conduct PR activities, requesting local inhabitants to reduce the amount of waste produced as much as possible and to recycle waste, and introducing the benefit principle vis-a-vis industrial waste, i.e. charging those producing industrial waste for the municipal collection of such waste.

Attached documents

Collectable Volume by Available Vehicles in 1994

Vehicle		Number of Available	Loading Capacity	Number of trip/day	Operation Rate	Collection Volume (tons/day)
Type	Age	Vehicles				
Compactor Trucks 11m ³ ~13m ³	Up to 3 years	15	4	4	0.8	192
	3 - 5 years	21	4	2	0.6	100.8
Compactor Trucks 6m ³ ~8m ³	3 - 5 years	2	3	2	0.6	7.2
Trucktor (FOR AGRICULTURE)	Up to 3 years	3	1.5	3	0.8	10.8
	3 - 5 years	13	1.5	3	0.6	35.1
	5 - 8 years	23	1.5	2	0.2	13.8
Multi-Loaders	Up to 3 years	3	3	2	0.8	14.4
	3 - 5 years	3	3	2	0.6	10.8
Total						384.9 tons

* Except Dump Truck's data

* Vehicles with usage year of more than 8 years are not included because of an operation rate of 0%.

The average current number of trips is approximately 2 to 4 times. This was done because the distance between the central city and the Wellampitiya landfill site is much nearer than latest site.

Operating rate on July 1995

Date	District 1		District 2A		District 2B		District 3		District 4		District 5		Total																			
	Number of vehicles		Number of vehicle		Number of vehicle		Number of vehicle		Number of vehicle		Number of vehicle		Total number																			
	Day shift	Night shift	Day shift	Night shift	Day shift	Night shift	Day shift	Night shift	Day shift	Night shift	Day shift	Night shift	Day shift	Night shift	Day shift	Night shift																
1	10	2	7	59	15	10	14	52	10	3	10	50	10	2	11	46	7	1	5	58	9	3	9	50	61	21	56	52				
2	9	2	10	53	14	10	15	48	11	3	9	55	8	2	13	38	7	1	5	58	9	3	9	50	58	21	61	50				
3	9	2	8	53	14	10	15	48	11	3	9	55	9	2	12	43	7	1	5	58	9	3	9	50	59	21	58	50				
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